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Beyond Their Means

THE tumult and the shouting have subsided. This country has set aside six billions to tide Europe over another year. Yet it is already urged - particularly on behalf of England - that this cannot cure her dollar deficiency. It is hinted that the scale of aid is inadequate, that a year's succor cannot do the trick, that western Europe may become a permanent pensioner of the United States.

This will not be an easy burden for the American people to accept. No fine-spun rationalization of exchange deficiency can overcome the suspicion that there is "something rotten in the state" of ERP. In this the practical instincts of the American people may well prove a sounder guide to policy than the expositions of Ph.D.'s or the exhortations of diplomats.

In considering the chronic exchange difficulties of our friends, it may be well to bear in mind the origins of the problem. In all fairness we must admit that the war had something to do with it. Insofar as dollar deficiency is the result of English sacrifice in a common cause, there lies a valid claim to our sympathetic interest and generous help. A further valid claim may be admitted insofar as such help is an investment in common defense against a new foe.

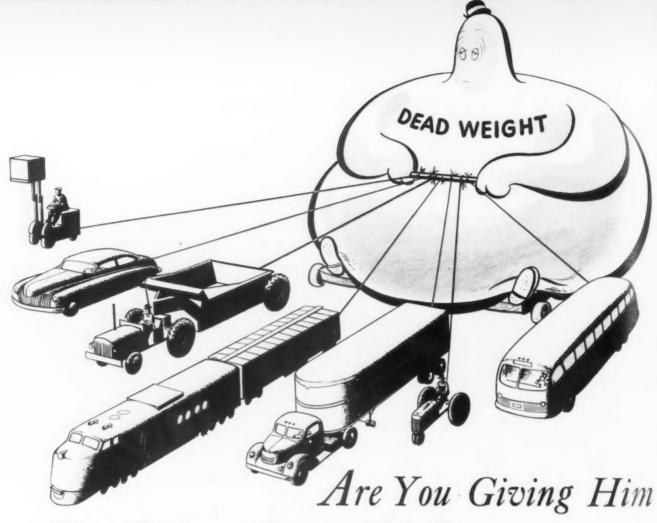
Beyond this we run into exclusively English responsibility for the current exchange predicament. A country's currency becomes weak basically for one or both of two reasons: The government may be spending more than it collects in taxes, with the difference coming from the banking system in the form of inflationary credit. This expresses itself at home in higher prices, which is simply another way of saying that the pound is losing value. If this loss in purchasing power is greater than the loss sustained by the dollar, then a free market will register this greater deterioration in a lower pound - dollar exchange ratio.

Such relative deterioration is difficult to measure between one country with price controls and another with free markets, particularly if both governments collaborate in the maintenance of a fixed exchange rate. There is good reason to believe that the pound has retreated further in value from its prewar base than the dollar.

A second source of basic weakness is the balance of trade. If Britain persistently buys abroad more than it sells, the supply of sterling will consistently exceed the demand. English export production has not been able to match in value the imports deemed necessary to sustain the English economy.

In both instances, domestic inflation and a refractory import balance, the English have been living beyond their means. Either their productive efficiency must improve or they must lower their standards of living. The other alternative, permanent subsidy by this country, is hardly acceptable to a proud and energetic race.

Joseph Stagg Lawrence



a Free Ride on Every Trip?

Inland Hi-Steel's High Strength-to-Weight Ratio

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If you're looking for a way to cut operating costs on mobile equipment, look to Inland Hi-Steel. This remarkable low-alloy steel has nearly twice the yield strength of ordinary structural steel, and stands up 50% better under dynamic loads. Because lighter sections can be used without sacrificing strength, Hi-Steel

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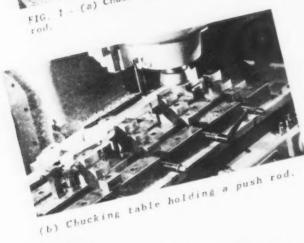
Hi-Steel meets the requirements of SAE Specification 950



- Washington economists are wondering if the world price slump now being predicted by some British industrialists is wishful thinking. Britain suffered heavily by price increases after its last loan and would like to see the tables reversed under ERP.
- By heating vaporized oil and passing a high voltage charge through it, one tin mill is able to coat an area of 2 million sq ft with 1 lb of oil. At least two other mills are using the same practice, although area coverage obtained by them is not positively known.
- The increase in union dues of steelworkers has already been interpreted in some quarters as a union declaration of intent for 1949. They point to Phil Murray's declaration that the extra funds might be necessary to maintain the workers who may be idle because of strikes. An opposite view may be obtained from Mr. Murray's assertion that a contractual commitment is a sacred obligation and that one must keep it. The major contract expires next Spring.
- British second-hand cars bring premium prices too. Recently 20 of them were brought up from the bottom of the Thames and sold forup to 75 pct more than they would have brought new. The cars, meant for export, were salvaged from the hold of a steamship which had been in a collision. The dealers who purchased them for amounts far in excess of list price expect to make a further profit on them.
- A 9 pct nickel alloy originally pushed for steel subject to very low temperature, has found its biggest application to date as tubing in deep wells where carbon dioxide type of corrosion is encountered. The use of this steel for low temperature work has yet to be decided.
- When do wasters become prime sheets? A Congressional investigating committee wants to know the answer. At least one major producer of steel sheets has been selling wasters at prices usually identified with prime sheets, according to Washington reports. Look for the company's explanation to come out in a Capitol Hill hearing.
- Recently displayed in Detroit was a standard make car equipped with all-aluminum trim, welded aluminum grille and aluminum bumpers. The aluminum is anodized to give added protection against corrosion.
- Seven-day melting and new equipment are cited as major reasons for continued improvement in British steel production, enabling the government to raise the target to 14½ million tons. Production is currently at a rate of more than 15 million tons annually, and consumer allocations have been increased. Those opposing nationalization of the industry believe these improvements show it is not needed, while those favoring nationalization point out that the impending legislation has caused producers to drive men and machinery to the utmost.
- As predicted, the steel capacity argument is up again. The industry's 5 million ton expansion plans are being called too small and some steel company economists are inclined to agree privately that more will be needed in the next 10 years. No one has figured out where the industry will get the money.
- A steel authority has been quoted as saying that using the best possible mill equipment the Russians were planning as recently as 1945 to use three times as many men to produce a ton of steel as is now required in this country.
- British makers of metal pre-fab houses are now studying the American market for this product. Their primary interest is to determine what adaptations are necessary to make their product suitable for sale in this country.
- Some steelmakers using new fast-charging electric furnaces are finding that their costs on low carbon and rimming steels are coming closer to openhearth costs where direct hot metal is not available for the openhearth. High raw material costs make comparison difficult now. But it is known that electric furnace sales and inquiries are substantially better though power shortages are holding up some business.
- Large steel buyers may soon find it advisable, in order to maintain their supply sources, to purchase more steel at locations closer to the mills. The latter, following present or potential law, and looking at rising freight absorption bills, may not be able to service even large customers at remote points.



Economy Factors in Carbide Milling

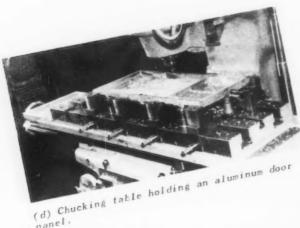


Experiments on cutting life of carbide tipped face mills focused the author's attention on many factors other than actual tool design that influence cutting tool life. The results of extensive tests on three types of carbide face mills, reported herein, stress the importance of such factors as work rigidity, cutter feeds and speeds, work piece hardness, carbide grade and machine load in improving cutting efficiency.



(c) Chucking table holding a truck axle

By A. O. SCHMIDT Research Engineer, Rearney & Trecker Corp., Milwaukee



panel.

HE technique of carbide milling, advanced and generalized during the war, is one of the most important aids in peacetime production. Yet, in high-speed milling with carbides there are many important factors, often overlooked or easily ignored, which can make or break a job.

Rigidity of an entire setup, especially in holding the workpiece, and reduction of loading and unloading time are important considerations which can be taken care of in the design of the holding device or fixture, assuming that a machine of sufficient capacity and in good condition is employed. Better cutter life, accuracy of work, and surface finish are obtainable if the work is held securely. However, workpieces that are not stiff by virture of their configuration or shape are difficult to hold properly with the vises and clamping arrangements ordinarily available unless fixtures are used.

Frequently, shops which do not produce parts in large lots cannot justify the expense of special fixtures which would otherwise be desirable. In such cases, a milling machine table specifically designed to permit rigid holding and quick handling of a great variety of shapes will prove profitable. Such tables, called chucking tables, are illustrated in fig. 1. Flexibility of setup is accomplished with a variety of interchangeable and reversible vise jaws.

The knee-type milling machine is a versatile production machine. An automatic table cycle mechanism which makes a knee-type machine more adaptable to volume production jobs is available. Although the machine can be fully manually operated, a predetermined automatic cycle assures uniform hourly production on both long and short runs. The entire operation is paced by the machines, but at the same time the operator is relieved of the necessity of many fatiguing motions, as illustrated in fig. 2. Both chucking table and automatic table cycle aid in reducing the total handling time per piece.

Because of the decrease in time per piece possible with carbide milling, cutters may wear out in a shorter time than would highspeed steel cutters although, of course, they will produce more pieces in that time. A question which naturally arises, therefore, is how many passes can be made with a carbide cutter. This question

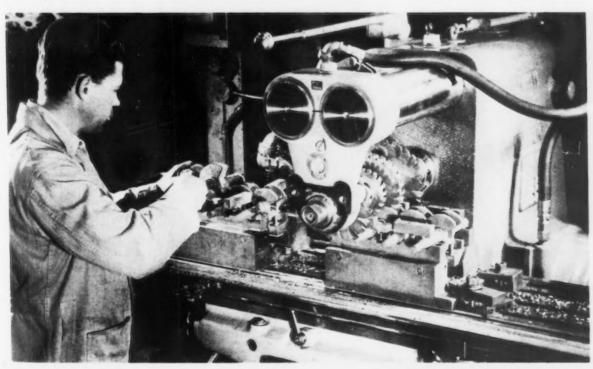
tion has been asked innumerable times and seldom can it be answered with a definite figure. It is especially difficult to answer when a particular kind of workpiece must be machined for the first time, or a new cutter design, a different tool material, machine tool or fixture has to be used.

Generally, after a number of trial runs the experienced shop man will be able to determine feeds and speeds which will permit near optimum production and also will be able to eliminate detrimental factors. This procedure will take varying amounts of time depending upon the conditions of the job. However, more or less constant improvement can usually be expected the more closely the job is attended. The following description of a particular milling operation in the shop serves to illustrate what can be done to improve performance after feeds and speeds have been settled upon. It also provides a typical answer to the question of how many passes a cutter can make.

A large steel block, fig. 3. annealed, 220 Bhn, was to be reduced in size. Ultimately, this required the removal of about 1½ tons of chips. A boring machine with a table large enough to accommodate this block and with a 15-hp spindle drive motor was selected. The cutters used were 8-in. CSM cutters with ten inserted solid carbide blades, similar to that shown in fig. 6. The width of cut of 3 in., depth of cut of 0.200 in., feed of 13 ipm, and cutting speed of 310 fpm required between 14.5 and 17.5 hp depending on cutter cenditions. Shortly before the cutters were removed for regrinding they usually were drawing higher horsepower due to blade wear.

Fig. 4 graphically illustrates how the number of passes per cutter varied over a period of three days. The average for all six shifts was ten

FIG. 2 - Production capacity of this knee-type milling machine is greatly increased by automatic pacing of the milling operation and reduction of cutter idle time through the means of the automatic table cycle.



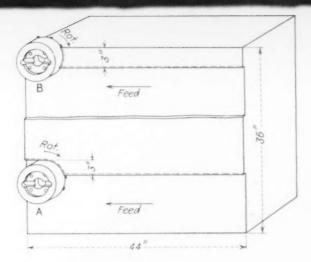


FIG. 3 - Diagrammatic view of a block of steel which was milled with identical cutters through six work shifts.

passes per cutter. During the first two shifts the cutters failed more often by chipping or fracture and only 107 passes were completed with 12 cutters. Since this particular machine had seldom been used for such heavy work, adjustments had to be made to correct looseness of clutches and play in shafts and in table movement which became evident during the first shift. During the third and fourth shifts fewer stoppages occurred since the machine was then better adjusted for this operation. Fifteen cutters completed 148 passes. Further improvement can be noted in the fifth and sixth shifts with 15 cutters completing 174 passes. General performance un-

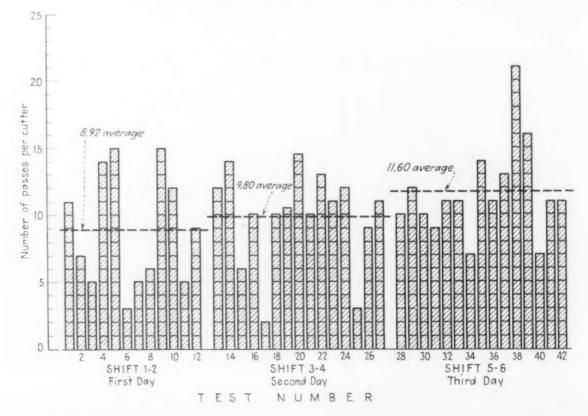
doubtedly would have been improved had a heavy milling machine, instead of a boring machine, been available.

When the cutter was milling as in position A of fig. 3, the wattmeter indicated 15 hp but only 12 hp in position B, the decrease being due to the greater efficiency inherent in the formation of shorter and thicker chips.

The cutters used in these tests were reground by experienced operators and had a 6° negative radial rake angle imposed at the cutting edge of a carbide blade positioned in the cutter body at a 15° positive-radial-rake angle. Quite uniform cutter conditions were assured when cutters were returned from the grinding department since all wear marks on the blades were eliminated in each regrinding. Cutters were removed when they showed 1/32-in. wear on the peripheral relief face as illustrated in fig. 5 at the top. The low number of passes on the first and second day was accompanied by cracking or chipping of the carbide blades. This type of failure can occur because of hard spots in the workpiece or momentary stalling of the cutter in the work, resulting from a loose clutch or an unexpectedly heavy chip. Sometimes the grade of carbide used is too hard for the job at hand. Fig. 5, at the bottom, shows a carbide tip that is chipped or flaked on the peripheral relief face.

The results plotted in fig. 4 represent production data under shop conditions as influenced by the machine, workpiece, and, last but not least, a good operator. Had the operator not adjusted the machine, if the cutters had been improperly ground, or if the workpiece become more difficult to machine, the gradual increase in production from one shift to the next might never have happened or an actual decrease might even have

FIG. 4 - This graph shows the number of passes made with each cutter in three successive days.



occurred. Fortunately, the tendency toward improvement noted here generally has been observed whenever carbide milling has been given

proper, adequate attention.

The graphs in figs. 9, 10, 11 and 12 show the frequency of the various types of wear and failure of carbide cutters. The operation analyzed consisted of face milling alloy steel wing hinges.2 Cutting speeds, cutter diameter, number of blades, and grade of carbide resulting in good operation had been previously established. The particular type of wear and failure of carbide cutters used in each run was recorded. Three different designs of cutters were used. These cutters were alike in size, number of blades, grade of carbide, relief angles, as well as true rake, the distinguishing feature of each type of cutter being in the manner in which the carbide



FIG. 6 - This 10-in. CSM face milling cutter has 12 solid sintered carbide cutting blades set at a radial rake angle of 15° positive. A nega-tive radial rake face of 10,0.025 in. wide, is provided at the peripheral cutting edge. The wedge is in back

of the blade to provide uninterrupted chip accomodation space.

ABOVE

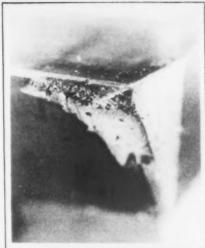
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ABOVE

FIG. 7 - This 10-in. facemilling cutter with 12 solid sintered carbide cutting blades set a radial rake angle of 7° negative and an axial rake angle of 7° negative.

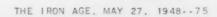
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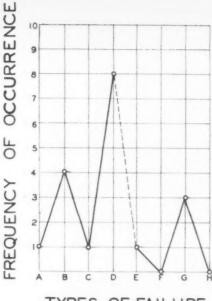
FIG. 8 - This 10-in. face milling cutter, with 12 brazed sintered carbide cutting tips, has the tips set a radial rake angle of 7° negative and an axial rake angle of 7° negative.





ABOVE FIG. 5 - The carbide tip shown above has worn 1/32 in. on the periphery, while chipping at the corner of the carbide tip shown below necessitated immediate change of tool.





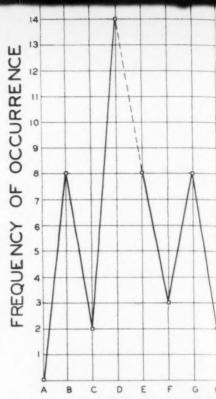
TYPES OF FAILURE CUTTER I

LEFT

FIG. 9 - This graphical analysis shows the type and frequency of wear and failure of 26 face milling cutters of the type shown in fig. 6. This type of cutter was most economical in overall performance and machined an average of 154 pieces per cutter.

RIGHT

FIG. 10 - This graphical analysis shows the type and frequency of wear and failure of 38 face milling cutters of the type shown in fig. 7. More undesirable types of failure and excessive wear occured with this cutter. An average of 98 pieces per cutter were finished.



TYPES OF FAILURE CUTTER II A

material was attached. Cutters with solid carbide blades wedged at either a positive or negative angle and with tips brazed directly to the body were tested. These types are shown in figs. 6, 7 and 8. Altogether, 74 face mills of 10-in. diam, each having 12 teeth were checked.

The machine operator had been instructed to remove the cutter for resharpening as soon as

The machine operator had been instructed to remove the cutter for resharpening as soon as the area of wear on the peripheral relief face became 1/32 in. wide (1/32 in. peripheral wear). Among other reasons, this criterion was chosen because it is easily visible and can be measured with a scale. If this type of wear prevails, it generally indicates that good cutting conditions exist.

Other types of wear and failure occur quite frequently and those observed in these operations are listed in table I. The types of wear tlesignated as A, B, C, and D are the more desirable since they can be rather easily eliminated in a relatively short time by regrinding. Types designated E, F, G, and H are objectionable, because regrinding is more difficult and time consuming,

and occasional replacement of carbide tips is required. If the latter types of failure occur too frequently it may be necessary to change the cutting speed, feed, depth of cut, grade of carbide, work-holding device, or cutter design; or shift the job to another machine of greater power and rigidity. The frequency of occurrence of these various kinds of wear and failure in the three different cutter designs is plotted in figs. 9, 10, and 11. From this analysis it was possible to determine the type of cutter most economical in regard to carbide wear and regrinding and resetting of blades.

A composite presentation of figs. 9, 10, and 11 is shown in fig. 12. For a given operation this diagram indicates conditions may be such that there is unobjectionable cutter wear, but that a certain amount of objectionable failure and excessive wear will also occur. If wear and failure of the kinds designated by E, F, G, and H of table I result too often, the entire operation may become uneconomical. High cutting speeds, excessively heavy feeds, hardness of workpiece, incorrect grade of carbide, or an overloaded machine are the main contributing factors to objectionable types of failure, especially in milling high-strength alloy steels.

The most commonly used methods of holding sintered carbides in a milling cutter are brazing the tips directly to the body or attaching removable teeth to the body with various mechanical locking devices. A removal tooth is either a steel blade to which a carbide tip has been brazed or a solid carbide blade. Tests indicate that carbide tips properly brazed to the cutter body are as strong as mechanically held blades. A cutter with tips brazed to the body is often the best selection in certain instances and is usually lower in initial cost. However, in long production runs,

TABLE I

Types of Wear or Tool Failure Occuring in Three Different Milling Cutters, Shown in Figs. 6, 7 and 8.

ferent Millin	g Cutters, Shown in	Figs. 6,	7 and	8.
		(utters	
		Fig.	Fig.	Fig.
Types of Wear	or Failure	No. 6	No. 7	No. 5
	A Excessive Periph	ieral		
Less Objec-	Wear	1	0	0
tionable Types	B- Corner Wear	4	8	4
of Wear	C-Face Wear	1	2	0
	D-1/32-in. Periphe	ral		
	Wear	8	14	5
	E-Crater	1	34	.0
More Objec-	F-Excessive Corne	r		
tionable Types	Wear	10	3	1
of Wear	G-Slight Chipping	3	8	1
	H-Breakages of So	me		
	Blades	0	2	n

 Numbers shown indicate how often the particular type of wear or failure occurred in the cutter tested. cutters with mechanically held blades will be more economical because resetting the blades in case of breakage or for resharpening is more simple and less time consuming. A hardened steel cutter body with mechanically-held blades is not weakened or damaged by repeated regrinding and brazing.

A typical time study is shown in table II of the reconditioning of a cutter with tips brazed to the body shown in fig. 8. Moving time between shop departments is not included.

An identical cutter shown in fig. 7, with solid sintered carbide blades wedged into the cutter body at a negative radial rake angle also required 35 min for regrinding, but only 15 min for resetting a blade in case of breakage. After four or five resharpenings all blades must be reset and sharpened, but this requires only

The CSM cutter, shown in fig. 6, with solid sintered carbide blades wedged into the cutter body at a positive radial rake angle required

ACKNOWLEDGEMENT

Acknowledgement is made to J. R. Roubik and Harold Francke of Kearney & Trecker Corp. for the help in the tests reported in this article and for the photographic work, respectively.

45 min for regrinding. Resetting a blade in case of breakage takes 15 min. However, since less material has to be removed in regrinding because of this particular blade design, this cutter can be resharpened eight to ten times before resetting and sharpening, which requires 11/2 hr, is necessary. Less breakage of single tips is another factor in its favor. In production runs fewer cutter changes with attendant delays will occur and number of workpieces finished per cutter will be high.

The number of workpieces machined per hour with a particular cutter is of prime importance in determining the economy of a carbide milling operation. Loading and unloading time is often much greater than actual cutting time and therefore much attention must be directed to decreasing this time with proper holding devices or fixtures. Rigidity of both the setup and the milling machine and adequate power as well as proper choice, use and servicing of cutters will help to "cut cost."

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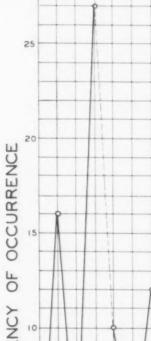
"Radial Rake Angles in Face Milling," by J. B. Armitane and A. O. Schmidt, Mechanical Engineering, Vol. 67, No. 8, August, 1945, pp. 507 to 510.
"Data on Production Runs with Carbide Milling Cutters," by A. O. Schmidt, THE IRON AGE, Vol. 156, No. 21, pp. 54 to 57, Nov. 22, 1945.

TABLE II

A Typical Time Study of the Reconditioning of a 12 Tooth Face Mill With Tips Brazed to the Cutter Body, Excluding
Moving Time Between Shop Departments.*

Operation No.	Operation Tim	ne. Min
1	Selecting, Grinding and De- livering New Tips to Braz	
	ing Dept.	10
2	Removing Old Tips and	d
	Brazing New Tips	54
3	Sandblasting Cutter	8
4	Grinding Faces of Teeth	45
ä	Grinding Periphery of Cutter	
	Teeth	18
6	Finish Grinding Relief and	1
	Clearances	4.5
	Total Time	210 Min. or 312 Hr.

If tips do not break, the cutter can be resharpened in 35 min, but can be resharpened only about three to five times before it must go through the reconditioning procedure outlines. In the event that only one tooth is broken, a new tip must be brazed on by following the outlined sequence, and to put the cutter into working condition again, about 100 min is required.

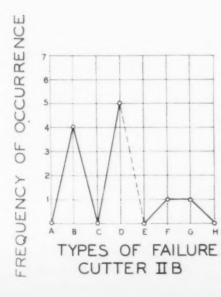


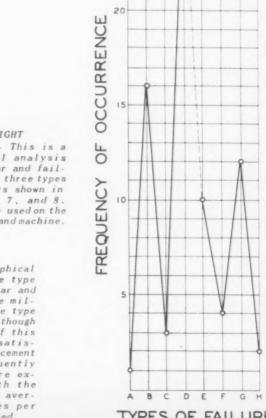
RIGHT

FIG. 12 - This is a graphical analysis of the wear and fail-ure of all three types of cutters shown in figs. 6, 7, and 8. They were used on the same job and machine.

LEFT

FIG. 11 - This graphical analysis shows the type and frequency of wear and failure of 10 face milling cutters of the type shown in fig. 8. Although the performance of this type cutter was satisfactory, the replacement of tips was frequently necessary and more expensive than with the other cutters. An average of 147 pieces per cutter were finished.





TYPES OF FAILURE

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The Standards Department

-Its Organization

By PAUL R. GODFREY

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LL manufacturing companies have specifications. Just why and how they arrive at those specifications is very often nebulous. Very few manufacturers have taken the trouble to really standardize all specifications on all materials used in production. That those manufacturers who haven't a real standards program are throwing dollars down the drain is evident from this report. Why does a company use a host of different steel gages, sizes and types, some of which vary only minutely? Who decides whether the finish on bolts and nuts should be black, bright, galvanized, nickel or cadmium plated? Should screws of dozens of different types be inventoried in dimensions of 1/32-in. increments? What is the best cure for the unnecessary wasteful and prevalent habits of the lack of standardization? Stewart-Warner Corp. believes they have found a method worthy of consideration by others, who wish to prevent one of the seemingly innocuous bad habits of industry, which adds unsuspected high cost in present

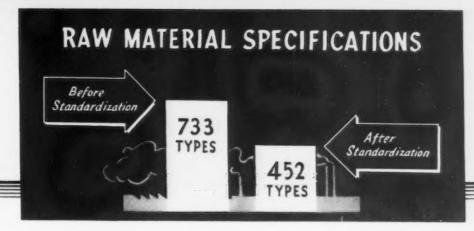
A complete standardization program for a manufacturing concern includes the application of the principle of reduction of variety of both material and effort, and the setting up of logical size or capacity increments to the following three activities:

- 1-Things purchased
 - (a) Raw material
 - (b) Parts
- 2-Things manufactured
 - (a) Parts
 - (b) Sub-assemblies
 - (c) Models (products sold)
- 3-Methods of manufacture
 - (a) Processes
 - (b) Design and drafting practices.

Because both the things manufactured and the goods sold are included, it is apparent that there are two interrelated avenues of approach to this problem. One approach is through the sales department, involving primarily the line of products to be carried. Based on a market analysis and a sales analysis much can be accomplished in the elimination of special items, the redesign of standard items to cover a wider field of usage, and the setting up of logical and uniform size or capacity increments. The engineering department is of course involved, but the emphasis here is on sales and sales policies. The limiting factors are inherent in the type of product and the type of customer.

The second approach is through the engineering department. It was felt that the engineering department could make a contribution to cost reduction regardless of whether the sales approach be attempted or not, however, desirable it may be that both types of standardization be carried out simultaneously. It is with this second approach that this article is primarily concerned.

Broadly speaking, then, by narrowing down the effort to the engineering approach, the first step in defining the problem was taken. At this time we had no standards department and no concerted effort of any kind along these lines.



and Function

A standards group, according to the author of this article, must be a part of the line organization responsible for product design. As a pure staff function the department cannot work in the most effective manner. Standardization is not an intermittant activity, it is ponted out, for intracompany standards vary as new products are added. Some remarkable findings of the department at Stewart-Warner are cited as examples of the definite contributions a standards department can make in reducing manufacturing costs and improving quality.

The next step was to analyze the points of attack in the enginering picture. Here the interest was with (1) raw material, (2) purchased parts, (3) "make" parts, and (4) processes such as heat treatment, plating, chemical processes, and spraying. It was decided to go to work on these four items.

This plan determined the form of the original organization. One man was assigned the task of classifying all the differnt raw materials used by type, grade and size. A second man classified and tabulated all the purchased parts. A third man set up a classified parts file or similarity file of all parts which were manufactured, and a fourth analyzed specifications for plating, spraying, etc. All of these men reported to the standards engineer whose responsibility was to direct and coordinate the program. The standards engineer reported to the chief engineer.

In general the functions of the standards department were to:

- 1—Compile, publish and maintain all specifications covering,
 - (a) Raw material
 - (b) Purchased standard parts
 - (c) Processes
- 2-Reduce the variety of types, grades and

sizes of raw material, purchased parts, and "make" parts and the variety of metallic coatings and colors of sprayed enamels and lacquers.

Proceeding on this basis, the results in brief outline were as follows: Difficulty was immediately encountered because of the chaotic state of the material specifications which covered less than half of the materials being used and, further, were obsolete and overlapping. The company's drawings carried its own specification number (if we had one), SAE specifications, AISI specifications, GE specifications, Chrysler specifications, and simply the name of the material or a trade name of a single vendor. For example, vulcanized fibre was identified under such names as "Armite paper", "electrical gray fibre paper", "Conite", "fish paper", "hard gray fibre", "gray horn fibre", and several others.

The aid of the chief metallurgist was enlisted to write a complete new set of raw material specications. A system of numbering these specifications was adopted which enabled us to group all the grades of any particular type of material together in one specification.

For example, specification number 100-00 covers cold rolled carbon steel sheet and strip

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as far as dimensional tolerances, edges, shipping instructions, etc., are concerned which apply generally to all the various grades of this material. The next section of this specification is numbered 100-01 and covers drawing quality, referring to 100-00 for its general properties and defining the particular qualities such as chemical analysis and hardness required for this grade. A specimen page from the raw material index is shown in fig. 1.

The purpose in using a straight numerical system was to facilitate the use of the specification numbers on punched card tabulating machines. This broke the log-jam in record files and stockrooms. Each material had a number which followed it all along the line from blueprint through purchasing ,inspection, stockroom, handling, right up to the machines.

At the start there were 733 items carried in stock and on records under all sorts of names

	Index — Fer	rous Metals	
	S-W		S-W
	Spec.		Spec
ARBON STEEL SHEET AND STRIP:	No.	STAINLESS STEEL SHEET AND STRIP:	No.
		Dimensional Tolerances and Finishes for Chromium-Nickel	and
old Rolled Sheet and Strip: Drawing Quality	100-00	Chromium Stainless Steel Sheet and Strip	
Soft Commercial Quality	100-02	Chromium-Nickel (302B)	
Quarter Hard		No. 1 Finish	165-0
Half Hard		No. 2D Finish	165-
Hard Commercial Quality Perforated—Diagonal		No. 2B Finish	
Perforated—On the Square		No. 1 Finish	
Perforated—Staggered		No. 2D Finish	
Perforated—Slotted	100-26	No. 2B Finish	
.020 Carbon Soft (1020)	100-31	No. 4 Finish	
fot rolled Sheet and Strip:		No. 6 Finish	166-
Pickled Commercial Quality	101-01	No. 8 Finish	
Pickled Physical Quality	101-02	No. 3 Finish—Light (Strip)	
Foor Plate—Standard	101-10	No. 3 Finish—Spring (Strip) Chromium-Nickel (304)	
Floor Plate—Light		No. I Finish	
erne Plate: Extra Deep Drawing		No. 2D Finish	
Deep Drawing		No. 28 Finish	
Agnetic Ingot Iron Sheet and Strip		No. 4 Finish	
		No. 6 Finish	
		No. 8 Finish	
		No. 3 Finish—Light (Strip)	
ARBON SPRING STEEL STRIP:		No. 3 Finish—Spring (Strip) Chromium-Nickel Stainless (310)	
Carbon Spring Steel strip:	130-00	No. 1 Finish	
35-55 Carbon Annealed	130-01	No. 2D Finish	
35-55 Carbon Tempered	130-02	No. 28 Finish	
	130-03	Chromium-Nickel Stainless (321-347)	
55-75 Carbon Annealed 55-75 Carbon Tempered		No. 1 Finish (321)	
55-75 Carbon Tempered 55-75 Carbon Cold Rolled		No. 2D Finish (321) No. 2B Finish (321)	
75-90 Carbon Annealed		No. 1 Finish (347)	
	130-22	No. 2D Finish (347)	17
75-90 Carbon Cold Rolled	130-23	No. 2B Finish (347)	17
	130-31	Chromium Stainless (410)	17
90-105 Carbon Tempered		No. 1 Finish	17
90-105 Carbon Cold Rolled	130-33	No. 2D Finish	
		No. 28 Finish	
		No. 4 Finish No. 6 Finish	
ALLOY STEEL SHEET AND STRIP:		No. 8 Finish	
Eectrical Sheet and Strip:	145-03	No. 3 Finish-Bright (Strip)	17
Armatura	. 145-01	Chromium Stainless (420)	
Electrical	145-02	No. 1 Finish	
Motor	145-03	No. 2D Finish	
Dynamo	145-01	No. 28 Finish	
Transformer .	145-05	Chromium Stainless (430) No. I Finish	
Magnet (3.5 Cr.) Strip:	146-00	No. 2D Finish	
Annealed As Rolled		No. 2B Finish	
As Ralled Magnet (4.5 Cr, 3.5 Mo.) Strip:		No. 4 Finish	17
Anneoled	147-01	No. 6 Finish	
As Rolled	147-02	No. 8 Finish	
Magnet (6.0 Cr.) Strip:	148-00	No. 3 Finish—Light (Strip) No. 3 Finish—Spring (Strip)	
Annealed		No. 3 Finish—Spring (Strip) Chromium Stainless (446)	. 17
As Rolled	148-02	No. I Finish	13
Magnet (17.0 Cobalt):	-149-01	No. 2D Finish	
As Rolled	149-02	No. 28 Finish	
Magnet (3.25 Cobalt):	150-00	Stainless Clad (20% Type 302)	
Annealed	150-01	No. 1 Finish	- (7

and numbers. When the job was finished it was found that there were actually only 452 different items. By merely clarifying specifications, a 38 pct reduction in records and stockpiles had been effected—and actual satudardization had not yet started. It must be said at this point that much of this confusion resulted from the last war, but it is, in our opinion. a convincing argument for the importance of keeping material specifications up to date and systematic.

Armed with the new specifications, Stewart-Warner set out to reduce the variety of materials in two ways: (1) Type and grade and, (2) size. Table I shows the results of these efforts in the heavy tonnage items as far as type and grade

are concerned.

When it came to sizes of material, the problem was not so simple. For example, drawings called for 90 thicknesses of cold rolled steel. Many of these sizes were special for a single part, and in some the requirements were as low as 5 lb per year. Of course, this is to be expected from the lack of any system for telling designers what sizes of material to use in their designs. Another contributing factor is the well known variety of gage systems which is beyond the control of any particular standardization program.

It was out of the question to make wholesale changes on the 15,000 active parts in production which would affect tools and fixtures and interchangeability with old parts from a service angle. A "hold the line" policy on all new design was adopted and the problem of changing current production was gradually worked out. In this way some of the problems solved themselves as parts whose service period had run out were can-

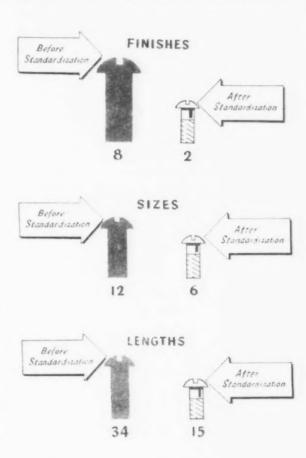
celled.

Plain carbon steel thicknesses were analyzed and 21 thicknesses from 0.008 to 0.180 in. were adopted which was a compromise between the popular sizes, the existing gage systems, and the geometric progression theory of Preferred Numbers (ASA Z17.1). Cold rolled steel is used in five tempers from drawing quality to full hard. Ninety thicknesses with five tempers in each gave a theoretical possibility of 450 inventory items exclusive of coil widths or sheet lengths and widths. In the remaining 21 thicknesses a further analysis was made and it developed that not all the five tempers were required in each of the thicknesss, which would be 105 inventory items, but that it would be possible to get along with only 63 combinations of temper and thickness. This is shown in table II. This table was then issued to all designers for their guidance The same type of analysis was made and the results issued for brass and aluminum and also for all nonmetallic material.

Purchased parts dealt with at the Stewart-Warner plant are mostly nuts, bolts and screws, lockwashers, resistors, condensers, etc., much of the standardization of which has been done on a national basis. It was found, however, there is considerable room for reduction of variety in a particular company. For example, if a pan head sheet metal screw will do everything that a round head one will do and possibly have some advantages as far as head height is concerned, then why use round heads at all?

Furthermore, it was found that, except in rare

instances, it was possible to get along without No. 1, No. 3 and No. 5 machine screws. Cases of screws dimensioned to 1/32-in. multiples on the length were found. With the commercial tolerance on length plus or minus 1/64 in., it would be impossible to differentiate between a high side 3/8-in. screw and a low side 13 32-in. screw. It also developed the screws had a multiplicity of finishes such as white nickel, cadmium, Parker-



ized, bright nickel, chromium, black, oxide, etc. As far as the chrome plated screws are concerned there can be little argument because they are intended to be decorative, but when it came to white nickel, cadmium and Parkerized, where appearance was not a factor, the finish used occurred haphazardly throughout all the products.

Here again, as in the case of raw materials, a book maintaining all the preferred types, sizes and finishes of about 10,000 common parts for the use of designers was issued. Length increments for screws were 1 16 in. to ¼ in., ¼ in. from ¼ to 1 in., and ¼ in. above 1 in. The end results, taking round head machine screws as an example, are shown in table III.

In the classification of "make parts", reference is to parts manufactured by ourselves. At this writing the job is far from complete. It was started later than the other lines of endeavor, and it is the biggest and most complete job. The similarity file, which will have about 55,000 parts when completed, is now about 90 pct finished. Here again a hold the line policy was adopted. Duplication and even triplications have been

brought to light; some out-and-out mistakes because of the lack of the file, and others caused by changes such as a case where two parts vary only in color to begin with and then later the color of one is changed making it a duplicate of the other but still retaining the original two part numbers.

The value of this file can be illustrated by taking plain flat steel washers as an example. It was found that the company had 361 different combinations of inside and outside diameters, 60 different thicknesses from 0.004 to $\frac{1}{8}$ in., 11 types of steel, all to make 495 washers! Compared with the record of another company which had standardized and found they were making 1919 different washers with one type of steel, 22 thicknesses from 0.004 to $\frac{1}{8}$ in. and only 146 different combinations of inside and outside diameter, it can be readily seen that our die cost per washer was considerably higher than theirs.

Another point that was brought out was that each of the 1919 washers was sufficiently different from the others to justify its existence, whereas we had washers that varied in size from another by only 0.001 or 0.002 in. on one dimension. We have not made many new washer dies since the washer file was completed. This item alone has paid for the entire similarity file.

In addition, the similarity file has increased the efficiency of designers and draftsmen who formerly had to spend about 15 pct of their time on a new development search through parts lists of similar models to avoid duplicating parts, which is hit or miss procedure at best. It has facilitated changes that apply to a part and "all similar parts". It is estimated that this has released about 140 man-hr per week for more productive work in the engineering department.

An interesting point about this similarity file is that it occasionally is of value where least expected. In one case we found that by performing one additional operation, a metal gasoline tank float consisting of two cup shaped stampings which are soldered together was converted into a can for a condenser on a radio. Standardization can work across unrelated product lines.

The standardization of process specifications did not contribute any startling savings as far as direct operating costs were concerned, but by establishing a numbering system which automatically classified similar specifications, the usefulness of standardization was increased within the engineering department itself. Formerly specifications of this type were numbered consecutively as the necessity to write them arose. As their number increased it became necessary to maintain an index which would group similar specifications together.

	Be	fore	Af	ter		
	Standa	rdization	Standardization			
Material	Types	Grades	Types	Grades		
Carbon steel sheet and strip	8	25	4	11		
Carbon steel bar and rod	4	22	4	20		
Brass sheet and strip	. 4	21	2	16		
Brass bar and rod	. 4	9	4	9		
Aluminum sheet and plate.	8	32	6	24		
Aluminum bar and rod	5	10	4	8		

The following numbering system was adopted. All process specification numbers begin with the letters PS followed by a digit giving its general classification as follows:

PS1—Heat Treatments

PS2-Plating

PS3—Chemical Processes

PS4—Enameling and Lacquering

PS9-Process Control-Specific

PS10-Process Control-General.

Each sub-classification was then designated by letters or numerals separated by a dash. For example, PSI—CY covered cyanide hardening. Details under the subclassification could then be shown by a numeral, two letters and a second numeral separated by a dash. Thus PSI—CY—IDWO would mean, as the specification shown, the I signifies 0.003 to 0.005 case, the D signifies quench directly from the cyanide bath, the W means quench in water, and the O means no draw.

This may seem complicated but the three such specifications covered all the case hardening operations, the one mentioned above and PS1-LC for liquid carburizing and PS1-PC for pack carburizing. Because of its flexibility it has saved the trouble of writing innumerable specifications to cover each combination of operations or making long notes on drawings. In plating PS2-100 is cadmium plating. The dash number following shows the minimum thickness in 0.001 in. Thus PS2-100-2 covers cadmium plating to a minimum thickness of 0.002 in. PS2-100 is standard cadmium plating, should any special process be required, it would be numbered PS2-101 and so on up to PS2-109. Zinc plating then starts at PS2-110, nickel at 120, copper at 130, silver at 140, chrome at 150 and so on, each with a block of ten numbers. In enameling, PS4-E covers all baked enamel finishes, the dash numbers following this indicate the color. Here again the practice is to segregate and classify by blocks of 100 numbers. Thus the PS4-E-100 series are blacks, the PS4-E-200 series whites, and so on.

Three sample steel panels of each color are made up by the industrial design department. The color number is stamped on the panels and one is sent to the enameling department, one to inspection and the third retained in a permanent file in the standards department where it can be seen by anyone interested in assigning a color to a product.

As new processes come up they can always be fitted into this pattern. It makes it unnecessary to keep a classified index of similar specifications as they are always automatically gathered together in a group.

Up to this point three volumes of Stewart-Warner Standards—Vol. 1, Standard Parts; Vol. 2, Raw Materials, and Vol. 3, Process Specifications—had been issued and it was felt that progress had been made. But it became obvious, as the project developed, that a standards department which merely analyzed a mass of data with the idea of reducing variety, and issued the results for design purposes, is doing only part of the job. Functioning thus as a staff department only, it has no contact with real problems. Further, it has no control over or power to en-

TABLE II

Preferred Thicknesses for Cold Rolled Steel

Thickness Specification	800	010	012	016	018	020	025	032	035	042	049	058	065	072	083	095	109	120	134	15à	180
100-01				x	x	×	x	х	×	×	H		×			X		×			
100-02	×	x	x	x	×	×	x	x	ж	X	x	x	×	ж	x	X	x	M	x	N	ĸ
100-03								×	×	×	ж		×	×		×		×			
100-04								x		×	×		H					×			
100-05	x	×	Ä	×	×	x	×	x	x	x	ĸ	ж	x	x	х	N	x	x			

force standards.

Also, it is not enough merely to establish the preferred types, grades, and sizes of materials. If we are really interested in cost reduction in each particular instance, it must be determined that the proper material is specified in the first place. For example, the plant was using nothing but the finest grade of laminated phenolic sheet for all parts requiring this type of material. Out of 110 parts, only four really required this quality. This is not necessarily a reflection on design engineers. They cannot be expected to keep up to date on all the cost factors involved in the selection of a material.

To meet this problem the standards department was changed from a purely staff status and made a part of the line organization responsible for design. To get this specialized knowledge required, a materials engineer was added to the group.

In outine, the personnel and their individual functions are now as follows:

1-Material Engineer

- (1) Acts in advisory capacity to engineers and designers in the selection of the proper materials and heat treatments, applying his knowledge of the chemical and physical properties of material; the methods used in fabricating them, and their relative cost as affecting the cost of the finished product. He is functionally responsible to the chief metallurgist.
- (2) Draws up and maintains all raw material and heat treatment specifications (Vol. 2 Standards)
- (3) Explores the possibilities of using new or different materials to effect reduction in cost or better performance consistent with the requirements of the parts.

2—Purchased Parts (Assistant Standards Engineer)

- (1) Sets up tabulated lists of all standard purchased parts (Vol. 1 Standards) and issues and maintains tabulated lists of preferred common parts such as screws, bolts, nuts, rivets, pins, etc.
- (2) Assists engineers and designers in the selection of such parts by applying his knowledge of all the available parts on the market and their relative costs as affecting the cost of assembly.

3-Similarity File Clerk

- (1) Groups "make" parts according to similarity of functions.
- (2) Sub-classifies parts within the group

according to similarity of shape and size.

- (3) Maintains the file in up-to-the-minute condition with regard to engineering changes and release of new parts.
- (4) Maintains file of all "foreign" specifications for materials and processes such as government specifications, customer's specifications, and the standards books of such companies as General Motors, Chrysler, Philco, etc., the published standards of ASA, SAE, ASTM, etc., and various manufacturers specifications and catalogs.

4—Process Specifications (Assistant Standards Engineer)

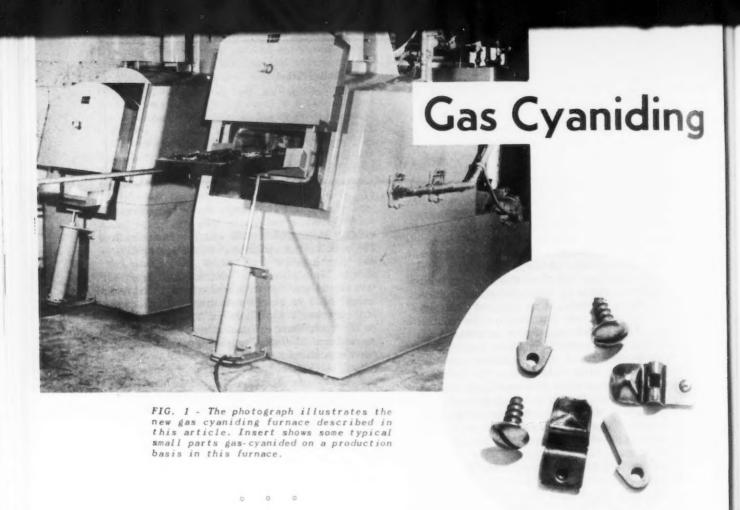
- Assists engineers and designers in the selection of the most suitable plating, spraying, etc.
- (2) Writes and maintains all process specifications (Vol. 3 Standards).
- (3) Maintains file of all colors used in production and also all colors specified on purchased parts.

5-Engineering Manual

This manual (Vol. 4 Standards) contains design standards and drafting practice instructions covering such items as standard sizes and tolerances for punched, drilled, and diecast holes; machine finishes, thread dimensioning, etc. Production engineering initiates this type of standards, and the standards engineer acts as coordinator between them and the chief draftsman and issues and maintains the printed standards in their final form.

This organization is geared in with the rest of the engineering department as follows: In the development of a new product each member of the standards department gives assistance, when it is requested of him, to engineers and designers in each particular field. When the design has been completed as far as the experimental drawings and bill of material, and before a working model is built, a complete set of blueprints of the experimental device is sent to the standards department. All the details are reviewed with a fine tooth comb individually and, where necessary, collectively. The materials are scrutinized for suitability for the parts in relation to functions as well as conformity to preferred type, grade and size. All the common attaching parts are examined to see where variety can be reduced. Employing give and take,

(Continued on page 148)



AS cyaniding has been known for 25 years, but until recently it has been practiced commercially only on a small scale. With new and improved controlled atmospheres and furnaces, some increased popularity for the process has been noticed, although liquid cyaniding is still the predominate method of light case hardening. There is little doubt that gas cyaniding can and does produce equal case characteristics, but before greater acceptance can come about, gas cyaniding must produce clean, and often bright, work, equivalent core properties on low carbon steels, and the equipment must be easy and economical to operate and should be as fully automatic as possible.

To obtain clean bright work by the gas method, a controlled atmosphere must surround the work until it reaches the quench, and the oil must be free of oxygen and must not break down at the surface of the hot steel. To date, bright hardening is only possible on small or thin pieces and will probably remain so until improvements in quenching oils are made.

A new type of gas cyaniding furnace, which incorporates the desirable features mentioned, has been developed and is illustrated in fig. 1. Particularly adapted for cyaniding small thinsectioned parts, operation is such that work pieces receive individual attention in the quenching cycle. This is illustrated in the schematic sketch, fig. 2, of a section view of the furnace.

The greater percentages of steels cyanided to-

day are the rimmed steels. Many of the parts made from these steels require core properties; typical parts are the self-tapping and sheet metal screws. To obtain the tough core, water or brine quenching from liquid cyanide baths has been the accepted practice. Since atmosphere-controlled equipment for gas cyaniding cannot be successfully connected to water quenching substitute steels with high manganese (or toher alloying elements), are quenched in oil with somewhat the same results. Fabrication difficulties and higher steel cost, in many cases, offset the advantages of the gas method.

Fig. 3 is a photomicrograph of SAE 1015 steel, gas-cyanided at 1600°F for 10 min, and quenched in a superquenching oil. This results in a file-hard case of approximately 0.005 in. and acore of 36 to 38 RC. The photo shows approximately 95 pct transformation to martensite in the core, indicating that the cooling rate was not sufficiently rapid. When the oil temperature was raised from 80° to 130°F, a more complete martensite transformation resulted. This example and further tests have shown that with this type of equipment, case and core properties equivalent to the use of liquid-cyanided and water-quenched parts are obtainable.

Fig. 4 shows a chart of comparative cooling rates of water, super-quench oil, and regular oil (mineral oil of 100 viscosity at 100°F) to ½ in diam x 2½-in. long stainless steel specimens quenched from 1500°F. If the TTT curve of

Small Parts

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The success of gas cyaniding, on a commercial basis, is said to have been deterred by the inability of existing furnace equipment economically to produce satisfactory surface conditions and metallurgical results. Use of a batch-loading, continuous-unloading gas cyaniding furnace, particularly adapted to cyaniding small thin-sectioned parts, is described in this article. The economic advantages of this process are emphasized, and detailed operating costs for cyaniding a typical part are presented.

say 1015 steel, was transposed, it would have its critical transformation temperature at 1000° to 12000° F. Water quenching from a liquid cyanide bath will actually move the cooling curve of water water at this temperature to the right, since adhering salt and partial batch quenching will not duplicate individual and chemical clean surface contact with the quenching medium. It is necessary, however, to have the absolute ideal conditions in gas cyaniding so as not to disturb the superquench cooling rate.

Two gas-cyaniding units are currently in operation, case hardening sheet metal and self tapping screws 24 hr per day for three manufacturers, meeting the physical requirement standards called for with liquid cyanide water-

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25

28

quenching. The type of equipment used originally was developed for heat treating small SAE 1035 fuse parts. A simple batch-loading continuous-unloading furnace was constructed and later another unit was built, combining the furnace and the quench-tank. Each unit was then electrically-connected to automatically perform the operations of heating, quenching and unloading.

The upper part of the unit is essentially a box furnace, having a usable hearth dimensino of 24x36 in. A quenching chute 6x24 in. extends vertically from the vestibule down into the quenching tank (fig. 2). The hearth has a 4-in. quadrant adjacent to the chute-opening since alloy roller drums are not used. An alloy flexible roller belt rests on the hearth; the power re-

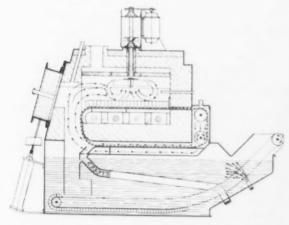


FIG. 2 - When parts are ready for quenching, the alloy belt on which they rest automatically moves slowly forward to drop parts almost individually into quenching medium.

RIGHT

FIG. 3 - Root of the thread of a sheet metal screw. Etchant 2 pct. nital. 100%.



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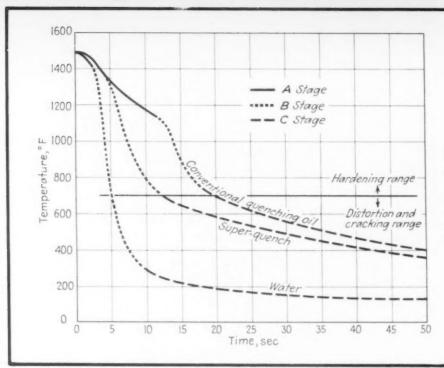


FIG. 4 - Comparative quenching rates of oil and water when quenching an 18-8 stainless steel specimen, 1/2 in. diam. x 24 in. length. Oil temperature 125°F; water temperature 100°F.

quired to move this belt with a load at 1650°F is less than 1 20 hp. A set of roller chains attached to the rear of the hearth belt pass through the insulation, over two sets of sprockets returning under the furnace, up the chute over a 4-in. alloy quadrant, and fastens to the front of the heat resistant belt. The chain and belt thus coupled together are endless.

Gas-fired units have full muffles and are fired with four burners, two on a side and offset. The flu is not located in the center of the roof but towards the front and absolute uniformity is obtained at all times. Certain units utilize a fan within the muffle for faster heating of small parts. The quench tank rests on the floor, eliminating pits and acting as a supporting member for the furnace. Cleaning of this tank has been simplified, inasmuch as all guides, shafts and supporting members are welded as a unit and are fastened at the rear with two bolts.

The door mechanism employed is a labor-saving device in that it eliminates overhead sprockets, chain, wedges, locking devices and packing trouble. Before the advent of protective atmospheres and sealed doors, furnaces and extended hearths, protruding beyond the door, acting as loading and unloading platforms. The operator worked comfortably, lifting and lowering his work only when the door was closed. In building atmosphere controlled furnaces the old design door was considered impractical to seal and was eliminated. So was the platfrom—a heat treaters tool. To make it worse, in many cases, a gas flame took its place.

The new streamlined furnace has a platform and is without the conventional gas curtain, In fact, the platform has a new duty—it serves as an elevator to help the operator lift and lower. Moreover, none of the sealing features of the door are lost. Only four parts make up the door mechanism; air cylinder, yoke, door and plate. The air cylinder uses no piston rod packing,

since air pressure is applied only under the piston. The loading platform yoke is not rigid to the door, for it has free lateral movement for proper sealing.

The operation of the unit, being automatic, requires the operator to merely load a scoop-full of parts on the furnace belt, set two timers, and press a button. One timer is for the heating cycle and the other timer is for the quenching delay. When the work pieces are ready for quenching, the alloy belt on which they rest automatically moves slowly forward into the guide chute to drop the parts almost individually into the quenching oil. As the work pieces drop, the quenching belt moves at twice the speed of the hearth belt, so that the parts are deposited in a thin layer on the belt. After loading, the furnace belt reverses to its original position and the quench belt discharges the work at the rear and continues around to its original position. The light on the panel board then signals that the unit is ready for another batch.

One feature of the unit is the elimination of the alloy atmosphere inlet tube. The atmosphere enters the rear duct, passes underneath the furnace, and enters the heating chamber at the quenching chute. This forms an inside curtain, eliminating cold spots and reducing heat losses. Movement of the quenching oil induces an added cooling rate to the parts being quenched, and coupled with the initial free fall in the oil, even larger pieces will receive adequate cooling speed to pass the nose of the TTT curve.

An example is the hardening of SAE 1035 study $^{5}{}_{8}$ in. diam x 5 in. long, gas cyanided for 10 min at heat (bar stock not removed in machining), and quenched in regular quenching oil at 90°F. The core hardness is 50 to 55 Rc. The atmosphere introduced into the furnace consisted of 200 cu ft per hr carrier gas produced by an automatic central station endothermic generator (type 302) with dew point about +2°F and

methane a little less than 1 pct. This carrier gas was enriched with 15 cu ft per hr of 1040 Btu natural gas, and 10 cu ft per hr of anhydrous ammonia. This atmosphere makes possible a hardened case 0.010 to 0.012 in., heat treating at 1550°F for ½ hr.

By substantially reducing or eliminating ammonia flow, the furnace becomes a gas carzurizing and hardening unit. By eliminating both the ammonia and the enriching gas, the furnace is a general heat treating unit. One unit in use for over a year is used exclusively for the bright hardening of small spring steel parts.

Gas cyaniding is economical. A simple accurate method to find total operating cost per furnace hour is to include labor, material and overhead costs for both factory and administration. Labor must be inclusive for all operations performed by the operator, from the time the work pieces enter the heat treating department until they are ready to leave as a finished product.

Referring to the cost sheet, table I, the cost data cover gas cyaniding of 135 lb of SAE 1015 steel sheet-metal screws per furnace hour. The direct labor is based on one operator handling eight units, and having a pay rate of \$1.20 per hr. Treating materials are: endothermic gas at 21/2¢ per 200 cu ft per hr, ammonia at 6¢ for 10 cu ft per hr, and natural gas at 1¢ for 15 cu ft per hr. Detailing factory overhead, the gas consumption is 160 cu ft per hr natural gas at 5¢ therm (100,000 Btu). A \$30 monthly maintenance costs includes labor and material. Inspection, laboratroy, order and service, and receiving and shipping are grounded together and are considered at 1¢ for every 10 lb processed. A large commercial heat-treating plant using approximately the same method of cost analysis shows a total cost of about 1/2¢ per lb for these items.

TABLE 1

Operating Costs For Gas Cyaniding 135 lb per hr of SAE 1015 Sheet Metal Screws. Cost and Expenses are on a Furnace Hour Basis. Computations Made From Average Plant Statistical Material.

1. Direct labor		\$0.150
2. Treating materials		0.095
3. Factory overhead in detail:		
(a) Fuel—Electric		
Gas	0.080	
(b) Maintenance (on equipment)	0.058	
(c) Outside work		
(d) Royalties		
(a) Inspection		
(f) Laboratory	0.100	
(g) Order and service	0.135	
(h) Receiving and shipping		
(i) Depr. and amort. (on equipment)	0.064	
(i) Insurance (on equipment)	. 0.016	
(k) Taxes (on equipment)		
(1) Occupancy—Building	0.024	
(m) General factory		
(n) Supervision	. 0.023	
Total factory overhead		0.461
Cost of work produced .		0.706
4. General and administrative	- 4	0.096
Total Operating Cost Per Furnace Hour .		0.802
Cost per lb .		\$0.00594

a 10-year period. Insurance rates total approximately \$25 per thousand dollars, and usual tax rates are \$5 per \$100 yearly on one-half valuation. With 135 lb work hardened per hr, the actual and total gas cyaniding cost per pound is a little less than 0.6¢. Automatic loaders can further reduce costs, but a study made of large and small industrial commercial heat treating facilities indicate that this type of equipment has a total cost lower than any present equipment.

Nondestructive Inspection of Porous Materials

Equipment is depreciated and amortized over

A N inspection method, which makes possible effective investigation of porous, or unfired, ceramic products to locate cracks before firing, has recently been revealed by the Magnaflux Corp., Chicago. The technique, called Partek, is particularly applicable to the nondestructive testing of porous powder metal compacts, insulator bodies, dinnerware, sanitary ware, and similar ceramic materials.

Partek processing may be by hand or by automatic operation and indications may be either brightly colored, to contrast with the body; or fluorescent, glowing when inspected under black light to mark each defect with a brilliant line of light. In operation, the surface of the clay to be inspected is momentarily flushed with a liquid suspension of Partek particles, which adhere along the cracks, held by differential filtering action between the crack and the unbroken surface. The cracks are made highly apparent by the particle indication, which marks them for high-speed viewing and allows defective ware to

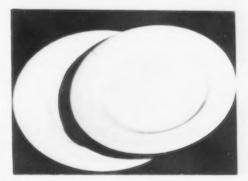


FIG. 1 - Plate at left shows Partek indication of an invisible crack, located before firing. At right is the obvious visible crack if fired.

be quickly separated from good ware entering the kilns (see fig. 1).

Salvage is speeded and made more effective on products like sanitary ware where repairing is desired. A visible colored or fluorescent indication is here developed below the surface as upon the surface. Normal scraping is used to remove the crack, following the crack indication beneath the surface until the entire crack is removed completely, to assure that it will not open in firing.

Increased

LEFT

FIG. 1 - Connecting rods are forged in pairs, end to end in this die, at the rate of 225 an hr.

BELOW

FIG. 2 - This shows the hot coining of connecting rods which, after coining, are pushed down a channel into a tote box.



FIG. 3 - Successive steps from bar billet to completed forging of connecting rods are here shown in front of the forging die.

Forging Die Life

By HERBERT CHASE

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Study of die lubrication and other factors causing die deterioration has reduced die and forging costs and resulted in lower steel consumption and scrap losses. Techniques developed and an outline of present studies aiming at flash thickness reduction are described in this article.

CONOMIES in the forge shop of International Harvester Co., Ft. Wayne, Ind., have resulted in part from a study of the factors affecting die life; and the introduction of certain changes that have doubled the life of some dies, reduced the consumption of steel per forging, and cut the cost of salvage operations.

Before discussing these economies, the scope of operations of the shop is best outlined by discussing some of the work done. The shop, 62x480 ft., operates 17 steam hammers ranging from 2500 to 10,000 lb capacity and three upsetters of 4 and 6-in. size. These produce about 150 tons of forgings a day for use in all Harvester highway trucks which this plant and another in Springfield, Ohio, manufacture.

All hammers are arranged in a row running the length of the shop. Side areas are used for upsetters, shears and for weighing forgings. Trim presses are set adjacent to hammers to facilitate local handling of heavy billets and forgings by monorail tongs.

Lubrication of hammer cylinders is accomplished by injecting oil into the steam supply line just above the steam shut-off valve at each hammer, under 70 psi pressure. A sight feed is placed

next to each such valve so that the oil supply can be shut off when the valve is closed. Oil lines parallel the steam lines so that the oil remains warm and flows readily in cold weather. Once the sight feed is set, when the hammer is put into service by opening the steam valve, the hammerman does not have to bother further about this lubrication until the steam valve is closed and the oil supply is shut off.

Both pusher and box-type furnaces are used and are supplied with a mixture of natural gas and oil, as experience in this plant indicates that such a mixture is more economical or efficient than either of these fuels used separately. Some \$6000 a year have been saved on fuel supply in this plant by this means, the saving being attributed to better vaporization of the oil. Some furnaces are equipped with mechanical loaders and all of the pusher-type have automatic thermostatic control of fuel feed.

At present, billets and forgings are handled within the plant mostly in tote boxes shifted by an overhead crane, but fork trucks are being introduced for such handling because they are safer and are believed to be more economical. Cranes will be employed for interior material handling only in areas not accessible to fork trucks.

FIG. 4 - In this dial-feed setup on a Bliss press, 1100 rod forgings are cold-coined per hr on flat faces.



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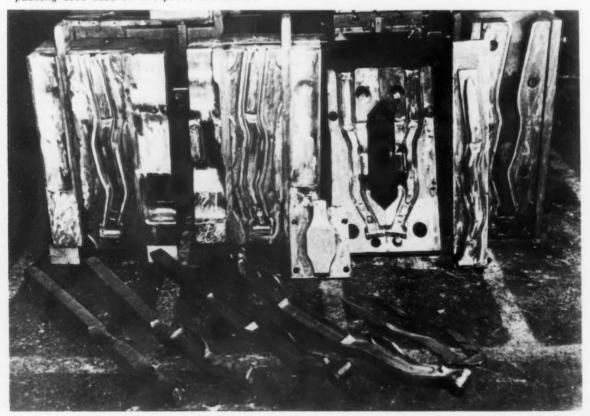
FIG. 5 - Die and successive steps in producing steering knuckle forgings. To provide the most desirable grain flow, the forging is formed from the end of the slug rather than from the side.

Bar stock for forging is stacked according to size and analyses in piles between uprights along a railroad car siding under a craneway outside the plant. All stock is color-code marked on bar ends for identification. Cars are unloaded by the crane, which also moves the stock as needed to racks close to the six shears that are just inside the shop. These racks are equipped with slotted nozzle gasoil burners. These are used only for preheating alloy steel before shearing. Stock employed varies from about $\frac{\pi}{8} \times 1$ in. up to 5×5 in. Prior to the war, 71 different steel analyses were used, but this number has now been reduced by about half, which simplifies handling, minimizes inventory, and reduces the storage area required.

Typical of small forgings is that for connecting rods produced in pairs, end to end, in a 3000-lb hammer, as shown in fig. 1. These forgings are produced at the rate of 225 an hr. Trimming follows immediately, after which hot coining is done in the press shown in fig. 2. This coining takes the place of a restrike in a hammer die. From the press, the connecting rods slide down a channel into a tote box. Fig. 3 shows the forging die, the square bar stock used, and the forging in successive stages.

After heat-treatment and scale removal, these forgings are delivered to the Bliss press, fig. 4, equipped with a dial type holder. Side faces are cold-coined to within 0.010 in. of specified thick-

 $FIG.\ 6$ - Two-stage dies are employed for forging front axles, one end at a time. The trim and padding dies used in the press are shown.



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FIG. 7 - In this 600-ton toggle press setup, front axle forgings are trimmed (left) and the spring pads are reduced to correct thickness (right).

ness at the rate of 1100 rods an hr. In this press, only one rod is struck per stroke, but the dial is fed automatically while being loaded and unloaded by hand. This coining reduces the thickness by 0.030 to 0.040 in.

Forgings for ring gears are produced from $5 \times 5 \times 8$ -in. square billets of SAE 4620 alloy steel in two 10,000-lb hammers at the rate of about 50 an hr. In the first operation, the heated billet is set on end and is flattened to a doughnut shape to provide the desired grain flow. After reheating, the forging is restruck in a die which gives it its final shape. In this, as in many other cases, a steam jet blows scale from the die.

Many round billets are descaled between heating and forging in rotary machines having motor driven rollers on which the bar rests while knives, held against the billet by spring pressure, remove the scale in a very simple and rapid operation.

Among the most intricate parts produced are those for steering knuckles produced in the threecavity die, fig. 5, usually from 316-in. billets. Steps in this forging operation are shown by partly and completely forged parts in front of the die. In the first operation, the spindle portion is extruded into a tapered hole in the lower die, leaving the remainder of the billet almost unchanged in size. The second cavity flattens and broadens the large end. The final cavity further flattens this end and forms the bosses and yoke to final forging size, ready for shearing flash. This method of forging the knuckle from the end of the billet slug is not the easiest but yields a superior grain flow and provides a stronger forging than for one forged from the side. The rate of production of this forging is about 60 per hr.

One of the largest forgings produced is that for the I-beam front axle, using the dies in fig. 6, and billets of 256-in. square SAE 1045 steel, 46 in. long. These billets are heated in box-type furnaces to 2250°F, and are forged in an 8000-lb hammer. Forging is done on one end at a time, in stages, as indicated by partly forged and completely forged parts in front of dies in fig. 6.

Immediately following forging, flash is trimmed off and the forging is placed in a padding die in a

600-ton toggle press, fig. 7, which sizes the forging and reduces the spring pad to the desired thickness. The foregoing operations are repeated, in forging and sizing the second end in the same dies. About 255 axle forgings are produced per 8-hr shift.

After transfer to the heat-treating department, axles are annealed and then go to the hardening furnace. While still hot, however, the axles are put into an Urshel stretcher, shown in fig. 8. Here, the hot forging is gripped on stretcher lugs by hydraulic clamps and the forging is stretched to required length. The clamping and stretching are

FIG. 8 - Axle forgings are clamped, stretched to length while hot, and quenched while still clamped in this Urshel machine.

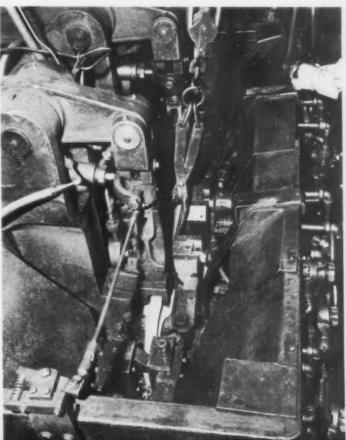




FIG. 9 - In this 6-in. upsetter the flange of a live rear axle shaft has been formed. Copper tubes supply a soluble oil solution to keep dies cool and wash away scale.

done in a quenching trough and, as soon as stretching is completed, the trough is rapidly filled with water, quenching the piece while it is still clamped. This avoids distortion in quenching and makes straightening before machining unnecessary. After quenching, the axles are put through the tempering furnace and are shot blasted before final inspection and delivery to the machine shop,

Live rear axle shafts are among the forgings that are upset. One such axle is shown in fig. 9 after upsetting the flanged end in the 6-in, upsetter. About 70 pieces an hr can be produced. This axle is made from 11%2-in, round alloy bars, 46%-in, long. The small end is previously upset for splining on a 4-in, machine at the rate of 150 an hr. Upsetting dies are kept cool and free of scale by directing continuous streams of soluble oil on die surfaces.

All forgings are weighed out and the count is checked in tote boxes before being delivered to the heat-treating department in an adjacent building. As a similar weight check is kept on steel delivered to shears, a check on scrap is always available. Operators are required to check sample billets cut to make sure that they come within the weight

limits required for forging so as to avoid either excessive flash or underweight forgings.

Inspectors check the weight of each of the last five forgings from each hammer at the end of each two-hour period, weighing being done to within 0.1 oz and certain specified dimensions are checked. Charts of dimensions and weights are posted continuously and certain of them are posted at the

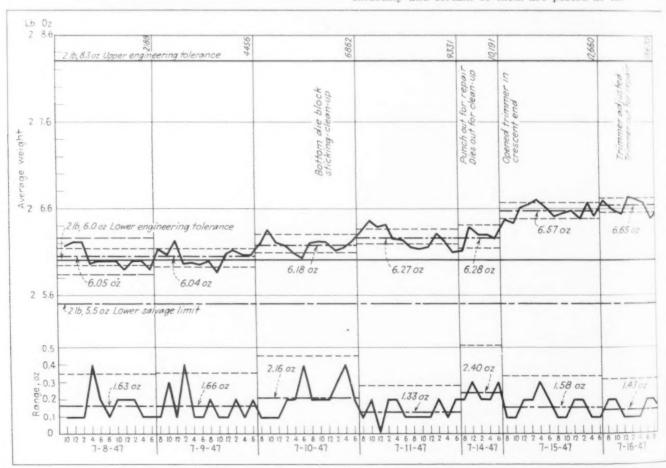


FIG. 10 - These graphs show how the weight of connecting rod forgings varied fore a die lubrication

hammers so that both foreman and operators have a visible record of the performance of the dies and hammers in use.

If either the weight or a critical dimension falls outside the limits specified, it is the duty of the foreman to locate and remedy the cause. This may require resetting the dies, removal of dies for redressing, or the alteration of some other factor such as a change in the temperature of billets delivered by the furnace.

Such checks are a part of the statistical quality control system which not only serves to keep forgings within required weight and dimensional limits but serves as a check on die wear. If the limits set are not held, scrap losses occur and the job is considered out of control.

Salvage operations can correct or compensate for some parts rejected for not meeting specifications, but such operations increase costs and can be minimized if not eliminated by giving prompt attention to factors that tend to permit forgings to go beyond tolerance limits. This is a major objective of statistical control, but such control provides a check on die performance, die life, and consumption of steel going into forgings.

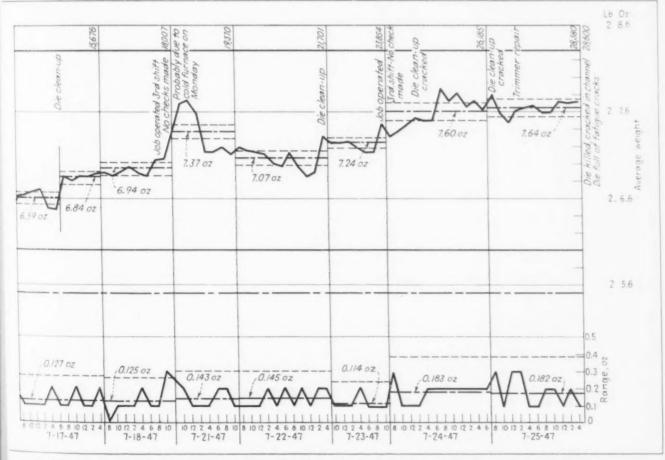
Fig. 10 is a control chart involving a progressive impression die for producing connecting rods. The upper graph shows the variation in the weight in pounds and ounces of rod forgings for eight days from Jan. 24 to Feb. 4, 1947. Below this is a second graph which shows the range of weight variation from zero to about 0.6 oz. As the die wore, the weight of forgings increased slowly until on the

fifth day, the weight exceeded the upper engineering limit of 2 lb, 8.3 oz that was specified. This resulted in regrinding the die surface and, later, in other die repairs which brought the weight within limits until, on the eighth day, the upper limit was exceeded again and the die was discarded as being beyond economic repair.

Fig. 11 is a similar control chart of a progressive impression die covering a period from July 8 to July 25, 1947. With this die, the rate of wear was considerably less rapid, presumably because of lubrication with Aquadag, a suspension of Acheson colloidal graphite in water, applied before the die was put into service. Some cleanup repairs were made, as indicated, but at no time did the weight of forging exceed the upper limit specified. On the 13th day the die showed considerable checking, but was continued in use throughout the following day, still yielding forgings within the limit weight. At the end of the 14th day, however, a channel crack and numerous fatigue cracks made it unsuitable for further use.

Dies from which the data used in figs. 10 and 11 were obtained were for making the same part and are understood to have been identical except for the use of the lubricant. The study of die lubricants has been proceeding for many months and is continuing. The study has included trials of copper plating. This deposit of copper was found to be a good lubricant, but the thickness of deposit proved hard to control and shipping occurred if too heavy a coat was used.

Use of oil as a lubricant was found undesirable



as the die wears, and the variation in range of weight over an 8-day period bepractice was adopted.

varied

as it tended to cause excessive checking and erosion, with resultant sticking and need for die redressing. With Aquadag, however, die life has been nearly doubled. In one type of die, average die life, before studies of lubrication were undertaken, was 11,900 forgings. With Aquadag lubrication, 22,500 forgings have been obtained. Aquadag is applied to the surface of new dies, and they are then heated, face down, until a temperature of about 200°F to a considerable depth is attained. The purpose is to bake the Aquadag on the impression surface. In theory, this impregnates the die surface with graphite. At any rate, it protects the surface during the breaking-in period, making it unnecessary to use oil, commonly applied at this period.

Increased die life, it is admitted, may not be entirely the result of better lubrication, but the latter is regarded as an important factor. Knowledge that a constant check is in progress and the posting of charts at hammers where operators learn to know their significance doubtless has had a favorable psychological effect. The increase in die life represents a significant saving, but it is

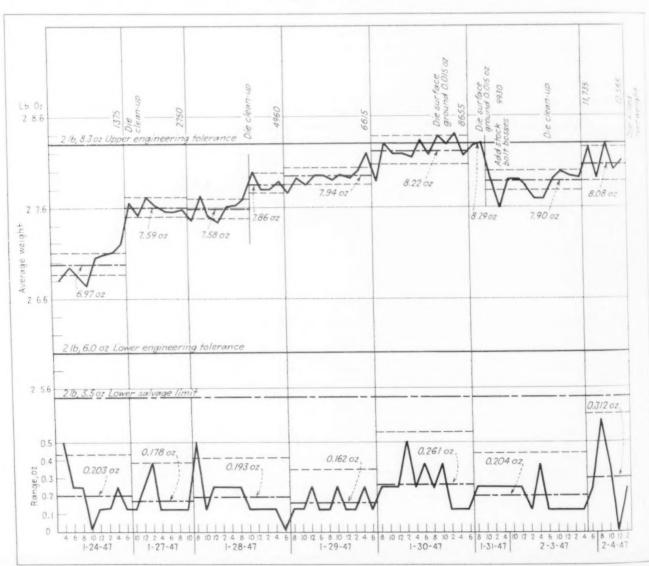
not the only saving realized.

Heretofore, the practice in this, and presumably in most forge shops, has been to slightly increase billet weight as dies wear. This increases steel consumption. Checks in this plant have shown that no increase in weight is required if a reasonable limit on the weight of the forging is set and maintained, as tests have shown that it can be. On one gear forging, die life was not only doubled but a 2 pct saving in material aggregating about \$2000 a year was realized. If this can be brought about generally, as anticipated, a highly significant saving in material will result.

Efforts are continuing along the lines indicated. but they are being extended. One objective tentatively set is the reduction of flash thickness from the 1/8-in. maximum commonly set to or about half this thickness. If realized, this will effect considerable savings in scrap and will also permit economies in the trimming of flash, as less work on trim presses and trim dies is anticipated.

Economies already realized and anticipated presumably will increase inspection and control costs, but the probable savings may more than offset these costs and result in higher standards in the quality of forgings produced.

FIG. 11 - These graphs indicate the performance of a die similar to that in fig. 10, but lubricated with Aquadag. Die life was increased and at no time did the forging weight exceed the upper weight limit.



New Production Ideas . . .

Gas-fired furnaces featuring cyanide pots, producing gas from Pentane by cold carbureting, an oil, lacquer, or drawing compound coating method for flat stock, lift-truck manipulation of molten metal in a foundry, cleaning steam condenser tubes by a brushing technique, and tube deburring, chamfering, and facing are production ideas discussed this week.

Gas-Fired Pot Furnace

A NEW type pot furnace, known as the Hi-Life gas-fired pot furnace, and featuring cyanide pots



that carry a 1 year guarantee, has been announced by Lindberg Engineering Co., 2444 W. Hubbard St., Chicago. It is reported that furnaces with from 8000 to 15,000 hr of operations behind them are still using original pots. In addition to longer pot life, the manufacturer claims faster heating and greater efficiency. The guarantee covers all Hi-Life pots used with cyanide or lead, neutral salts excluded, under automatic temperature control. The furnace is available in four standard sizes using pots 24x21 in.; 20x21 in.; 16x18 in.; and 12x18 in.

Inserted Carbide Tools

TURNING and facing tools, embodying a mechanical locking device for inserting solid carbide tool bits, have been announced by Viking Tool Co., Nichols Rd., Shelton, Conn. A hardened semi-cylindrical wedge-type lock located beneath the inserted carbide bit is actuated by a screw which locks or

retracts the wedge. As the design requires a small percentage of the carbide insert for locking purposes, the insert can be removed from the holder for regrinding, without disturbing the holder setup in the machine tool. The tools are stocked in standard shank sizes from ¾ to 2 in. Tool styles are straight, 15° nose angle, offset, and offset facing.

Double End Punch

A NEW principle of design has been incorporated in the No. 9 double end punch by Beatty Machine & Mfg. Co., Hammond, Ind., in shortening the distance from punching centers to 9 ft, and employing welded steel instead of the former cast construction. The



shortened machine is more rigid and occupies less floor space. Features include centralized lubrication and air counterbalance of ram. The machine has a 24-in. throat at each end and an architectural table with a front filler block to convert it to a plain table.

Vertical Indexing Machine

DRILLING, counterboring, reaming and milling can be done on the No. 3 vertical automatic in-

dexing machine announced by W. K. Millholland Machinery Co., 1048 Fairfield Ave., Indianapolis 5. The machine is equipped with a No.



3 Millholland motor-driven automatic cam-feed unit mounted vertically on the welded steel column. The 15-spindle multiple head is mounted on guide bars and equipped with a bushing plate arranged to register on the fixture at each index. The power-driven index table is mounted in large capacity, anti-friction bearings and runs in oil. Three, four, six, eight and twelve station tables are obtainable. Automatic continuous cycle or intermittent operation is controlled by pushbutton. One piece is completed at each index, giving a production of 500 pieces per hr. The machines are available in sizes up to 15 hp motor drive.

Heavy Duty Boring Machines

TWO Bore-Matics, Models 421 and 422, announced by Heald Machine Co., Worcester 6, handle heavy work without the necessity for special out-size equipment. Like other Bore-Matics, the machines THE IRON AGE, MAY 27, 1948-95

are capable of boring, chamfering, turning, grooving, facing or flycutting operations separately or in any desired combinations. The single-end Model 421 and the doubleend Model 422 are suited for mass



production of a single part requiring several operations or for single or multiple operations on several parts simultaneously. Outstanding features include adequate power for roughing, permanently lubricated boringheads, uniform hydraulic feeds, and smooth table motion. Simple control settings provide different rates of in and out feeds when two-way boring is required.

Roll Coating Machine

OATING of flat material with drawing compound, oil, glue, sizing, wax, paint or lacquer can be done with roll coating machines offered by Columbia Machinery & Engineering Corp., Hamilton, Ohio. The machine features 10-in. coating rolls and 8-in. doctor rolls. Large coating rolls reduce the angle of departure from the work, providing a more uniform spread. The doctor roll turns at a slower speed than the coating roll, the difference in speed producing a wiping action that contributes to evenness of spread. Depth of spread is set and maintained by an adjustment of calibrated handwheels. Standard coating rolls have a corrugated rubber surface with circumferential grooves, 0.025 in. deep, spaced 20 per in. Coating and doctor rolls are driven through a positive chainand-sprocket drive and a gearedhead motor, standard drive speed being 75 fpm. Coating machines are made in four roll arrangements for coating one or both sides of the material, and in roll sizes from 32 to 104 in. by 6-in. increments for handling material up to 102 in. wide. Material up to 4 in. thick can be accommodated.

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Gas Producer

PRODUCTION of gas from Pentane (C5-HI2) by a cold carbureting process can be accomplished in the Safe-Tee-Way gas producer, an electrically operated machine announced by Austin Tool Co., 1859 E. 63rd St., Cleveland. The fuel, stored preferably underground, is pumped to the producer unit where gas is generated by forcing air at a controlled rate of flow through a fixed amount of fuel. Gas is produced at a rate and amount, when and as required. to supply the demand of connected heating appliances. The machine is completely automatic, gas generation starting and stopping in volume directly proportionate to its use. Air is supplied automatically at a constant pressure regardless of



volume required. Fuel is supplied the producer as required by the use of gas, automatically maintaining the correct fuel-oil volume relationship at all times. Air and fuel motors are protected by overload and low voltage switches. The gas producer is built in one size, 23 in diam x 44 in. high. It has a gas producing capacity of 300 cfh. The gas produced has a heat value of approximately 3800 Btu per cu ft. The fuel is non-asphyxiating, non-poisonous, and odorless normally but tainted for identification.

Carbide Tipped Center Punch

A N automatic center punch for glass and hardened steel, having a cemented carbide tip, has been marketed by Vinco Products, 326 Bond St., Asbury Park, N. J. It is reported that 1000 holes may be punched in steel of Rc 60 hardness before the point need be sharpened. The marker is 4 in, long, weighs

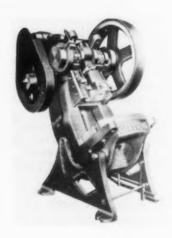
1½ oz, and contains a spring-actuated hammer tripped by pressure on the punch. Pressure of the spring may be adjusted to 8 to 20 lb by means of an adjusting screw. A shock absorber action permits adjusting the blow so that glass and light gage metals can be center-punched for subsequent operations without shattering or distorting them.

Shim Sets

TANDARD sets of shims in any shape of any size with any arrangement of bolt holes are available from U. S. Gasket & Shim Co. Hudson, Ohio. Each set consists of one 0.020-in. shim, three 0.005-in. shims and three 0.007-in. shims. Individual shim sets provide for unlimited arrangements of thicknesses and are fabricated of steel copper, brass, Monel and other ferrous or nonferrous material. Individual shims can range from 0.001 to 0.25 in. in thickness and overall shape sizes from 3/8 to 6 ft. Tolerances are held to 0.015 in.

Back-Geared Punch Press

WITH back gearing, providing a slower stroke with heavy punching tonnage, a new model punch press of 56-ton capacity has been announced by Diamond Machine Tool Co., Los Angeles 23. The press has been designed to strain gage analysis, equalizing stresses uniformly throughout the frame, which is cradle mounted and may



be inclined up to 35° Inclining or raising the frame is performed from front or rear by one man. A foolproof non-repeat trip mechanism is simple and positive in action. Standard stroke measures 3 in.; maximum stroke to order, 8 in.; strokes per min, 50; bed area is 21x30 in.

DC Relays

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TILIZING double-break, silverto-silver contacts, which are readily converted from normally open to normally closed without additional parts or tools, two dc magnetic multi-pole relays have been added to the line of machine tool controls manufactured by Square D Co., 4041 N. Richards St., Milwaukee 12. Long mechanical life is achieved through straight line vertical solenoid action which minimizes the effects of shock and vibration. The relays are steel panel mounted and insulated to permit direct mounting on a grounded metal panel. All terminals are accessible from the front, and equipped with two wiring clips to accommodate multiple connections. Types Q and R are available with 2 to 6 poles and 2 to 5 poles, respectively. Both relays are suitable for operation on de voltages up to 250 v.

Toolmakers' Microscope

THE Wilder toolmakers' microscope, marketed by George Scherr Co., 200 Lafayette St., New York 12, is a low-priced instrument consisting of a heavy Meehanite base and post, on which the Meehanite microscope bracket is vertically adjustable by spiral rack and pinion. The microscope tube provides a standard magnification of

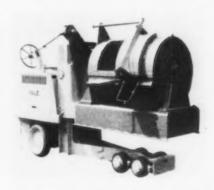


30X for the image of the work. To facilitate thread checking, the vertical post with microscope and bracket may be tilted to the helix angle of thread. The work is either laid on the compound measuring

stage or held in a center cradle that attaches to it. Measurements in two directions are by 1-in. heavy type micrometer screws that read directly in 0.0005 in. Longitudinally, a total range of 2 in. is provided. The standard equipment incorporates understage illumination for reflected images.

Foundry Transfer Ladle

FOR lift-truck manipulation of molten metal in a foundry, Yale & Towne Mfg. Co., Philadelphia, has developed a rotating transfer ladle attachment capable of receiving 3 tons of molten metal directly from the mixing ladle at the cupola, following the ladle lift up and down as the pouring proceeds, transporting the loads to the pouring ladles at the various casting stations, and

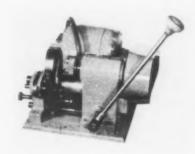


filling them as required. The entire operation is performed by one operator who rides the truck and controls all movements from a single position. The basic truck is an electric powered 8000-lb high-lift platform type with six steering wheels, for even load distribution and minimum turning radius. The ladle, lined with refractory brick, is permanently mounted on a heavy fabricated skid engaged by the platform of the truck and anchored to it. Rotation of the ladle is hand controlled from the truck driving position.

Tube Deburring Machine

A MANUALLY operated, bench type tube and rod end-finishing machine, embodying a mechanical chuck and chuck closing mechanism that positively holds any length tube, pipe or rod up to 2 indiam, is offered by Pine Engineering Co., Aurora, Ill. Deburring, chamfering, and facing can be completed separately or simultaneously

in a single pass of the machine. It is possible to deburr, chamfer, and face tube and pipe ends, or to center-drill or form rod ends at the rate of 500 to 1000 per hr. Produc-



tion depends upon the size and length of the stock, cut taken, and the material. Change of cutting tools and inserts for various operations requires approximately 1 min. The tool holder is slotted to receive three cutters.

Condenser Tube Brush Cleaning

BRUSHING technique for A cleaning steam condenser tubes has been developed by West Penn Power Co., Pittsburgh, and Osborn Mfg. Co., Hamilton St., Cleveland. Cleaning the steam condensers involves the use of specially designed nylon brushes approximately 4 in. long and ranging from 34 to 1 in. diam, depending upon the ID of the tubes. A special coneshaped steel washer, slightly smaller than the ID of the tube, is welded to the wire stem at the trailing or pushing end of the brush. The brush is placed in the end of the tube and shot through the tube by water at 200-lb pressure delivered by a specially-constructed, nozzlelike gun. The brushing method rids the tube of mud and slime, and brushes off and washes out all algae.

Work Supports

To provide quicker and more efficient operation on certain types of lathe work, a De Luxe type follower-rest and center-rest have been developed by South Bend Lathe Works, 381 E. Madison St., South Bend 22, Ind. Wrenchless adjustment and locking of the jaws are features of the tools. Each jaw has a knob for adjusting the jaw position, and a thumb screw for locking. Each revolution of the ad-

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ning or formed man. A mechain acsures 3 justing knob provides approximately 3/16 in. jaw movement. Jaws are made of brass and slide through precision steel sleeves which are pressed into the supporting frame. Both follower and center-rest are available for South Bend lathes.

Emulsion Cleaner

HCOloid emulsion cleaner has A been developed by Apothecaries Hall Co., Waterbury 88, Conn., to replace hydrocarbon and chlorinated solvents. It can be used on all metals, including buffed zincbase diecastings or aluminum parts. The cleaner has special surface active agents which impart to it a high degree of emulsifiability, wetting and penetrating action, and rapid rinsability. It is classed as a safety solvent with a flash point of 100°F. Operation is at room temperature and steel tanks are used for the cleaning procedure, which involves immersed agitation, followed by a water rinse. If the work is to be plated, a light alkali cleaning is necessary.

Water Displacing Products

WO water displacing products announced by Metal-Clean Solvent Corp., 1935 N. Paulina St., Chicago, produce a moisture-free surface on ferrous and nonferrous metals, lifting water droplets instantaneously and leaving a protective film on the work, it is reported. Water thus displaced drops to the bottom of the tank where it can be drawn off. Fingerprints are neutralized and water stains prevented. Metal-Clean No. 11 is used as a cold dip and requires no further blending, agitation, or control. Metal-Clean No. 12 is a water displacing type of rust preventive, especially designed for work which is to be held for storage. It is applied by cold dip, brush, or spray.

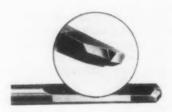
Graphitized Lubricants

TWO graphitized lubricants known as Miracle Power and dgf-123 have been announced by AP Parts Corp., Toledo. Miracle Power is used in motor oils and gasolines, while dgf-123 provides a dry graphite prelubricant for application to engine parts before assembly. In Miracle Power, synthetic colloidal graphite is suspended in a fine grade of pure, light pegs. THE IRON AGE, MAY 27, 1948

troleum oil. The dgf-123 is a concentrated dispersion of colloidal graphite in alcohol and carbon tetrachloride. It is intended for use only as a pre-lubricant of parts before assembly. When used as directed, either of the two lubricants gives metal surfaces a thin graphoid film.

Drill for Hardened Steel

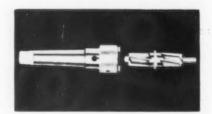
A CARBIDE drill for drilling high-speed steel at 66 Rc hardness has been announced by National Tool Salvage Co., 6511 Epworth Blvd., Detroit. The drill is



specially ground which results in faster cutting and less heat. Holes 1 in. deep can be drilled in as little time as 60 sec with negligible wear on the drill, it is claimed.

Double End Counterbore

A COUNTERBORE, with cutting edges at two ends is announced by Plan-O-Mill Corp., 1511 E. Eight Mile Rd., Hazel Park 20, Mich. Called the Plan-co double-end counterbore, the new tool comes in a complete range of sizes in high



speed steel or with tungsten carbide inserts. Both single and multi-diameter styles are offered with or without pilots. Collet and sleeve holders provide fast and easy tool replacement and furnish a positive drive with runout of less than 0.002 in.

Exterior Enamel

SUITABLE for factory-finishing over aluminum and resistant to outside exposure, a synthetic heat-

hardening low-gloss enamel has been developed by Sherwin-Williams Industrial Div., 101 Prospect Ave., N.W., Cleveland. Tests have shown the finish to be resistant to 2000-hr accelerated weatherometer exposure and 1500-hr salt spray exposure. It also has withstood 50 cycles of a heat and cold test during which there was noticeable expansion and contraction of the aluminum base. After surface preparation, the aluminum may be roller coated with primer and baked, then fabricated and sprayed with the finish bake coat. Or, both the primer and finish coat may be applied after the metal has been fabricated.

Sapphire Balls

SYNTHETIC sapphire balls polished to a sphericity of less than 10/1,000,000 in., unaffected by acids and with a hardness second only to diamond, are being produced by Linde Air Products Co., unit of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17. Aging and creep phenomena do not appear in sapphire balls. Applications of these low-friction, chemically inert and heat-resistant spheres to specialized problems in engineering and chemical processes are unlimited. Experimentation has shown that sapphire balls are useful for many high-temperature bearing assemblies and for bearing installations subject to contact with chemical agents. Clear sapphire balls are offered in limited quantities in the following sizes: 1 mm. 1/16, 18, and 14-in. diam.

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Tinning Pencil

R USTPROOFING metal, regal-vanizing spots, tinning bearings, and other tinning operations can be done with the Kromover touch-up pencil developed by All-State Welding Alloys Co., Inc., 96 W. Pond Rd., White Plains, N. Y. It will tin oil-impregnated bronzes, burned cast iron, stainless steel, and black iron without removing mill scale. Oil and dirt must be wiped off. The surface tinned will be good for soldering but darker than if the metal had been ground down beforehand. Dismantling is usually unnecessary for applying the pencil. It can be applied with oxyacetylene, airacetylene, or city gas flame, melting at 450°F.

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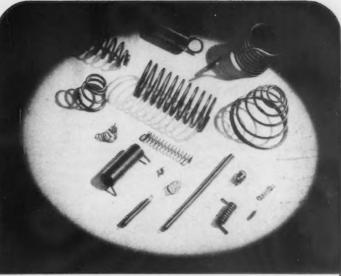
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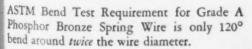
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· Studebaker strengthens its hand in the truck field . . . New Jeepster will be introduced in July . . . State police move in on Chrysler strike . . . GM Truck opens a new engine plant.



ETROIT - The truck field continues to attract car producers and Studebaker expects to win a firm foothold in this market with its new line of trucks. The new trucks are being introduced at dealer meetings throughout the country. Additions to the present Studebaker line of trucks include a 2-ton model, a 11/2-ton 171-in. wheelbase model designed to take a 14 or 15 ft body and a 3/4ton truck.

Attractively styled but utilizing a minimum of chromium trim, the trucks have been designed to give improved accessibility and driver comfort. Some emphasis has also been given to design innovations that simplify assembly operations.

The new cabs are lower and several inches wider than the earlier models. The new frame is heavier and has a minimum of three boxshaped cross members to give added stiffness and strength. All electrical accessories are easily accessible from beneath the hood. The radiator supports are constructed so that the radiator core can be removed for servicing simply by removing six bolts, disconnecting the water hose and tilting the radiator forward.

Running boards have been taken inside the cab which is fitted with many passenger car items including double windshield wipers, sun visors, arm rests, an ash tray and a reading light that operates automatically when the door is opened. Doors are double-sealed against weather and the revolving-type self-adjusting door latch used in Studebaker's passenger car line is specified.

An extension to the clutch pedal enables the driver to press the starter by depressing the clutch the full distance. The starter button can also be operated separately if desired.

Window openings are substantially larger than the earlier models, having 23 pct more glass area. The windshield is the divided type.

A new technique is utilized in assembling the hood and fenders. In place of 14 stampings formerly used, only four stampings are now being used, according to Studebaker engineers. The front fenders. grille and hood are now being subassembled as a unit and lowered into position as the new trucks come down the line.

The new Studebaker radiator grilles are made of a single steel stamping. Instead of chromium plating, the stamping is painted all over with ivory paint; the matching color of the truck is then added with the ivory showing through at the grille opening. In the heavier truck models, the bumper is painted rather than plated. Chromium plated bumpers continue to be used on the lighter models, however.

The entire area surrounding the engine has been insulated to resist heat and vibration. Inner door panels are painted metal rather than fibre board of artificial leather that is sometimes used.

A new device operates automatically to correct the speedometer when the two-speed axle is being used. Hardware is somewhat heavier than was formerly employed. An air silencer for the carburetor has been added on some models.

While the smaller models are somewhat heavier than the earlier trucks the new heavy duty models weigh about the same as their predecessors.

The new trucks are being built in the air conditioned plant used to produce aircraft engines at South Bend during the war.

URING July Willys-Overland will formally introduce its new sport phaeton, the Jeepster. Assembly operations of the sporty little convertible models with a manually-operated top begins this month. By mid-July it is expected that all Willys dealers will be stocked with the latest Willys-Overland version of the wartime Jeep.

Production schedules call for completion of between 15,000 and 20,000 Jeepsters by the end of the year. The new models will have 104 in. wheelbase for which all stampings will be made in the new Willys-Overland press shop. The Jeepster is powered with a 4-cylinder engine and comes equipped with overdrive. The new cars are expected to average about 25 miles per gallon under normal driving conditions.

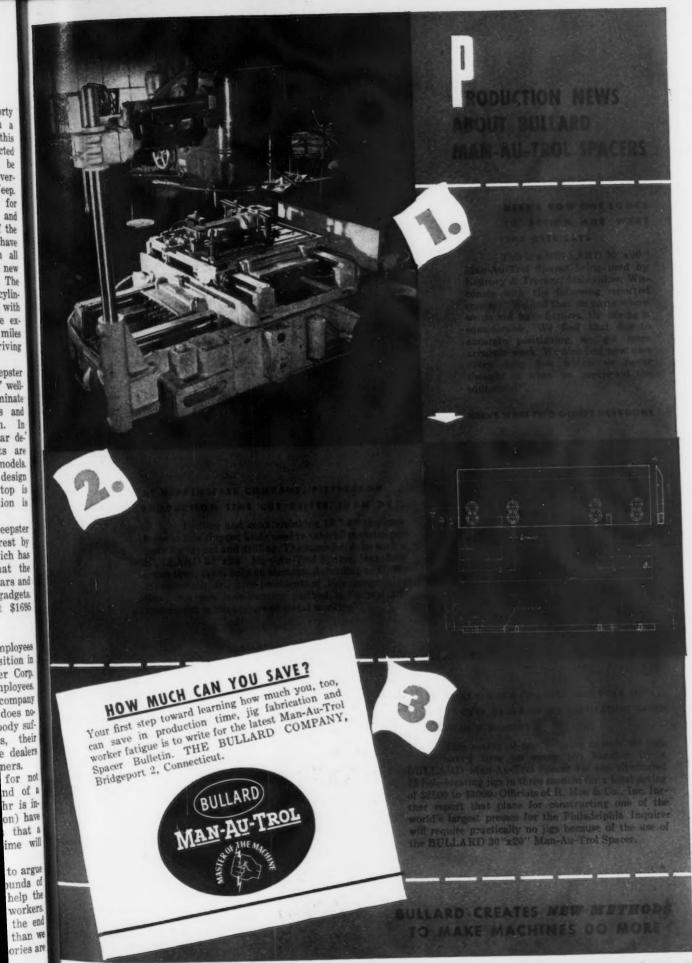
Introduction of the new Jeepster marks another step in Willys' wellintegrated program to eliminate the frills from motor cars and stress economical operation. In contrast with many other car de' signs, most of the gadgets are eliminated from these models. Willys engineers claim the design of the manually-operated top is such that one-man operation is easily accomplished.

Willys' progress with its Jeepster will be watched with interest by the rest of the industry which has consistently maintained that the motoring public wants big cars and fancy cars with lots of gadgets. The Jeepster is priced at \$1695 f.o.b. Toledo.

To familiarize the employees with the company's position in the current strike, Chrysler Corp. sent out a letter to all employees. Among other things, the company pointed out that a strike does nobody any good, that everybody suffers including employees, their families, the company, the dealers and the company's customers.

Chrysler's explanation for not meeting the union demand of a wage increase of 30¢ an hr is interesting: "They (the union) have simply not persuaded us that a wage increase at this time will benefit anyone."

The letter then went on to argue that the two previous rounds of wage increases failed to help the purchasing power of the workers The letter continued, "In the end most of us were worse off than we were before. The same theories are



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being advanced now in support of a third round," the letter said. In its letter Chrysler confirmed

In its letter Chrysler confirmed the report that its offer of 6¢ an hr increase was rejected by the union. The letter also set forth that the union had reduced its original demand of 30¢ to 18½¢ per hr.

Of the 75,000 Chrysler workers unemployed at present, all but 10,000 work in the Detroit area. Many unionized office and administration workers are reported to have joined the men and women on the picket lines. Some sources are predicting that 100,000 more workers may be idled as the effects of the strike mushroom throughout the industry.

Meanwhile, action against the strikers who are charged with violating Michigan's Bonine-Tripp Labor law was ordered by the Attorney General of Michigan to test the constitutionality of the new law.

One ironic incident has highlighted the strike thus far. On his recent visit to Detroit, Henry A. Wallace, the presidential candidate, joined the picket line in an open bid for support of the United Autoworkers. Mr. Wallace has previously been denounced by Walter Reuther, president of the UAW-CIO, as a tool of the Russians. His third party is openly opposed by the UAW-CIO.

Using his best political manner, Mr. Wallace told the pickets over the loudspeaker that their wage boost could be won without higher automobile prices or seriously impaired profits for management.

After addressing the picket line, Mr. Wallace is said to have handed the microphone to a nearby picket who promptly invited the crowd to join him in singing, "I Had a Dream, Dear." He didn't complete the song but the incident furnished an amusing topic of conversation in Detroit on the eve of Mr. Wallace's recent speech at Olympia stadium.

Following the outbreak of fisticuffs at the Chrysler Highland Park plant, Michigan State Police have been ordered to patrol some of the plants to maintain order. The troops have been ordered in by Gov. Sigler. State intervention had been requested by Mayor Norman Patterson of Highland Park after 15 Highland Park patrolmen were roughed up in a near riot at the Oakland Ave. entrance of the plant.

This is the only picket-line flareup thus far but the underlying strong feelings of the hot-heads of the union make it strongly advisable to maintain adequate police protection at all times.

It is hardly likely that Ford's recent demand for what amounted to a wage cut and the impasse reached in the GM negotiations will make disgruntled union members any happier. Talk of a GM strike is already being heard but most sources believe the calling of a GM stoppage is not likely except as a

desperation move by union strategists.

F INDING a solution for its steel problem has made quite a difference in Packard production. During the first 4 months of this year and despite the loss of 14 working days in January and February because of the industrial gas shortage, Packard assembled 27,206 units compared with only 16,020 units produced in the same period a year ago.

During April Packard hit a new postwar production record for the second consecutive month and seem. ed well on the way to another production peak in May. The Chrysler strike is not expected to interfere seriously with Packard production. Incidentally, Packard is also reporting substantial profits at today's operating rate, netting \$1,304,727 in the first quarter compared with a loss of \$1,148,173 for the same period last year.

June 13 has been set as Ford family day when more than 100,00% Ford employees and their families will preview the new 1949 Ford automobiles. A similar showing was held at the Lincoln-Mercury plant recently when these cars were introduced. Ford officials have reported a very satisfactory response to this program which they feel gives employees an early opportunity to show off the cars to their families.

*

Similar programs will be held at Ford branch assembly plants. There will be rides in the new cars, souvenirs for the children and refreshments for everybody. Ford branch plants are located at Atlanta, Buffalo, Chester, Pa., Chicago, Dallas, Edgewater, N. J., Kansas City, Long Beach, Louisville, Memphis, Norfolk, Richmond, Somerville, Mass. and St. Paul, Minn.

GMC Truck & Coach Div. is now operating two engine assembly lines, one for large engines, and another for small engines, at its new plant on South Blvd. in Pontiac.

*

All engine assembly and machining of all parts are performed in this plant which currently employs 900 workers. Present production is about 500 engines per day.

The new plant is completely modern from a standpoint of lighting, conveyers, hoists and other material handling devices.

EASY ACCESS: Access to instruments, gages and electrical wiring is made easy in the new '49er Studebaker trucks by the big hood opening. After removing six bolts, the radiator core can be tilted forward for removal. The grille is a single steel stamping and both the grille and bumper are painted instead of chrome plated.



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MANUFACTURING

• Administration set to try again on controls... NSRB plan rejected... Trade associations on the griddle...Mr. Mason analyzes basing point decision.



ASHINGTON — Despite continued rebuffs from Congress on the question of production, wage and price controls the Administration last week was getting set for another try. The executive departments have been busy accumulating data for the White House to justify a new stand for measures to control the nation's economy.

The new approach reportedly will emphasize the inflationary aspects of national defense plans, and, more important, the need for meeting production schedules for munitions items.

A preliminary report of the National Security Resources Board which calls for emergency standby powers is reported to have brought about this new phase in the battle for controls. NSRB wants standby powers to control the entire economy and wants to see itself in the driver's seat as the master control agency. The report was authorized by Ferdinand Eberstadt, New York banker and former WPB official who now holds a top job on the NSRB staff.

While NSRB will not comment on the report it is a well-known official secret that the President tossed it out on the grounds that it was too broad and had no chance of getting through Congress.

THE NSRB plan is described by I officials who have studied it as "ambitious beyond verbal description." The Cabinet was particularly vehement in denouncing this grab for power. The Commerce Dept. led the objectors, since this agency would like to have a direct hand in administering any control legislation that might be enacted. Commerce now administers the remnants of the Second War Powers Act, covering tin, antimony, and quinidine and has a working nucleus of former WPB officials in its voluntary allocations divisionthe Office of Industry Cooperation.

After rejecting this plan, the President is reported to have ordered several executive agencies, notably the Commerce Dept., to make a new analysis of industrial resources and the demands now facing the economy in order to determine whether any immediate controls are needed as contrasted with a long-range standby proposition. He is expected to come up with a new plea for controls before Congress adjourns next month.

On Capitol Hill, Republican leaders still maintain an "over my dead body" attitude in regard to full controls, despite the fact that several isolated converts have been won over as a result of the steel industry's refusal to allocate steel to metal prefab house producers and the slowness with which a voluntary allocations agreement for the petroleum industry is proceeding.

R EPRESENTATIVES of trade associations are quietly pushing legislation which they hope will strengthen the research and development functions of their organizations.

Trade associations, particularly those engaging in publishing price data for their member firms, are anxious to prove to Congress and to the executive branch of the federal government that their primary reason for being is to carry on research and development activities.

To this end, legislation (S 2673, HR 6496) sponsored by Senator Flanders, R., Vt., and Representative Keating, R., N. Y., would grant

a federal charter to the American Standards Assn. and would thereby permit agencies of the federal government to participate in ASA research in standardization.

The Flanders and Keating measures are currently under study by the Senate and House Judiciary Committees. But barring unforeseen energy on the parts of the proponents of the bills to force debate and vote, the measures are likely to remain under committee study until the end of the present session of Congress.

Basically, ASA activities in the field of standardization are but an extension of the program launched more than 20 years ago by Herbert Hoover, acting as Secretary of Commerce. ASA today is a federation of 72 technical societies, trade associations, and governmental agencies. There are, in addition, 35 associate members and more than 2,000 company members who supply the bulk of ASA's financial support.

Trade association executives are particularly concerned, however, by the recent remark of Federal Trade Commissioner Lowell B. Mason that "if the laws stand as they are now, I predict trade associations are out."

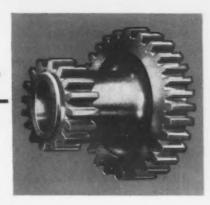
Mr. Mason, a Republican, is generally regarded as one of the most literate bureaucrats in the federal government.

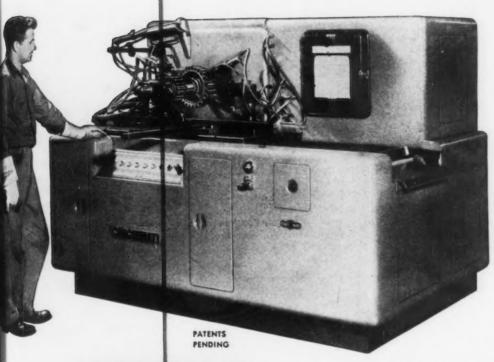
In a speech before the Marketing Club of Harvard University's Graduate School of Business Administration, Mr. Mason said the "present administrative trend will make life so uncomfortable for members of associations that the hazards of membership will hardly be worth any legitimate advantages."

COMMENTING on the recent Supreme Court decision which ruled out the use of basing points in the cement industry, Mr. Mason said he believed that the multiple basing point pricing system is "out as a matter of law," and that it is also "out as a matter of plain economics,"

"I think there are more businessmen in this country who would welcome a mill base at every point of

1 of 40 parts...





Laughte	12"
Pirch diam.:	5.235 and 9.333
Diametral pitche	**
Materfalt	Cast steel alloy (.4050 C; .90 - 1.10 Mn; .5565 Ci
Surface hardness:	up to 50 Rockwell "C"

THE CINCINNATI

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HARDENING MACHINE

... Flamatic hardened at substantial savings over previous methods.

Unit Crane & Shovel Corp. uses the Cincinnati Flamatic for surface hardening an unusually wide range of parts, and gets exceptional results. This 60-pound cluster gear, for instance, requires only a 6-minute cycle to harden the large O. D., only 4 minutes for the small O. D. Except for loading, operation is automatic and desired "physicals" are obtained uniformly, part after part.

High temperature flames heat the surface rapidly to within plus or minus 5°F of the desired preset temperature, at which instant the electronic "Eye," through relays, causes the part to be deposited in the oil quench.

Core properties: unaffected. Distortion: negligible. Work size capacity: gears, pinions, cams, etc., up to 12" diameter depending on width, shafts up to 18" long depending on diameter.

Unit Crane & Shovel Corp., for whom this machine was equipped with special (yet low cost) fixtures, writes: "Flamatic has been successful beyond our expectations... The reduction in our cost for this operation has been such that it has proven a very profitable piece of equipment." Write today for complete 20-page catalog.



INCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U.S.A.

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businessould welpoint of production than there are businessmen who wish to maintain either the Pittsburgh-plus or the multiple basing point system," he declared.

Mr. Mason also expressed the opinion that under existing law freight absorption, zone prices, and an individual universal delivered price system are outlawed. "Government will probably first attack the pricing system of those heavy commodities where the freight is a large percentage of the cost of the article to the purchaser," he stated, listing the following commodities as examples: Iron and steel, lime, rubber, glass containers, builders' supplies, farm equipment, ice, road machinery, paint and varnish, business furniture, liquified gas, auto parts, ladders, paper and pulp, structural clay products, china and porcelain, reinforcing materials, vitrified clay sewer pipe, anti-friction bearings, wholesale food and grocery products, end-grain strip wood block, construction machinery, paper bags, lye, and wholesale coal.

Six predictions of things to come were listed by Mr. Mason: (1) Congress will never legalize any price-fixing system provided they know what they are doing. (2)

Hereafter, anyone who wants will be able to take factory delivery on anything he wants to buy. (3) There will be a decentralization of users of basic products. (4) There will be an amendment to the Robinson-Patman Act so that the variances in profit or mill net will not be the earmark of discrimination. (5) Trade practice conference legislation will pass with even greater exemptions than those contained in the legislation I proposed before the American Bar Assn. in October 1947. (6) Unless there be changes in the present law, future court decisions will all turn to a further mechanization of the law.

Business Spending Shows First Quarter Increase

Washington

• • Business spending rates during the first quarter of 1948 increased sharply, rising from \$30 billion to \$36 billion, according to Office of Business Economics data. The bulk of the boost, however, went into accumulation of inventories, mostly at the trade level.

On the basis of first quarter figures, the gross national product rate stands at \$244 billion, a rise of \$3 billion over last quarter 1947. It is broken down into \$173 billion for personal consumption expenditures, \$40 billion for domestic and foreign business expenditures, and \$31 billion for government spending.

Personal consumption spending rates increased by about \$700 million for the quarter but a survey reveals that the increase is almost entirely due to higher prices rather than greater volume of goods purchased. Personal income is now estimated at about \$209 billion, including \$135 billion in salaries and

Government's annual spending rate rose \$1 billion during the quarter and is attributed entirely to increased spending for foreign aid. This may be expected to increase sharply by the end of the third quarter, at which time the Economic Cooperation Administration expects to have its European aid program well under way.

Tinplate Authorized For Some Types Coffee Cans

Washington

• • Following consideration of an appeal filed by coffee packers, changes in Conservation Order M-81 (tin cans), to permit use of some tinplate in the manufacture of certain types of coffee cans, were announced by the Office of Domestic Commerce, Dept. of Commerce.

The changes will not result in any additional overall use of tin, and no increased allocations of the scarce metal for can making are contemplated since the amendment is permissive only, officials said.

The new specifications allow use of .25 lb tinplate in soldered or welded parts of all sizes of cans for packing soluble coffee, to assure moisture-proof seams. Blackplate still must be used for other parts.

Use of .25 lb tinplate in 2-lb and larger sizes of cans for packing regular coffee also is authorized for the soldered and welded parts, with use of blackplate still required for other parts. Coffee cans smaller than the 2-lb size still must be made entirely from blackplate.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



● To adequately handle the required production of a specific job, many manufacturers find Morris Mor-Speed machines not only capable of meeting production requirements but also exceptionally economical in operation.

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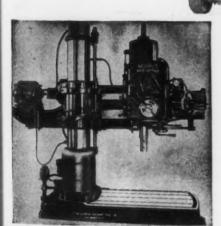
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acking zed for s, with red for smaller e made An interesting example is the Morris machine shown. This vertical type machine, with hydraulic automatically operated indexing fixtures, drills — reams — counterbores — countersinks and chamfers holes in various positions in Refrigerator Compression Cylinder parts. There are thirty-one vertical spindles driven by a hydraulic unit and eight horizontal spindles rack fed from the hydraulic unit.

Operation is extremely simple. Operator merely loads and clamps work in position by hand, unclamps and removes finished piece. All other operating functions are automatic.

The Morris organization has the engineering "know how"—manufacturing experience—and shop facilities to design, develop and install high production equipment to meet special job requirements. Consult them on your high production jobs.

MORRIS MOR - SPEED Six-Station Vertical Hydraulic MACHINE



MORRIS MOR-SPEED RADIAL



• Steel allocation to rail car building program disturbs western users, while producers show reluctance to give details of participation . . . Boeing strike may test T-H law.



AN FRANCISCO — Both independent and subsidiary steel producers in the West are strongly reticent about their respective shares of the allocation of steel recently accepted by the Steel Producers Advisory Committee for construction of freight cars and repairs to railway rolling stock for the third quarter of this year.

Steel users in the West have been somewhat concerned about the tonnage of plate and structurals which might possibly be shipped out of this trade territory to fulfill the promises made by the members of the advisory committee. So far as can be learned there is little cause for them to worry for at least 6 months since but little repair and construction work for railroads is anticipated during that period.

Only major construction program is that on the schedule of Pacific Fruit Express Co. which intends to start production of approimately 3000 refrigerator cars early in 1949 in its shops at Colton, Roseville and Los Angeles, Calif., for which it is estimated approximately 6000 tons of plates and structurals will be needed. Both the Southern Pacific and Western Pacific railroads deny that they plan any car building here in the West. The Southern Pacific Co. is having 1650 gondola cars built for them by Bethlehem Steel Co. at Johnstown, Pa. but no

western steel is scheduled for this operation. These cars will be of 50 ton capacity, 41 ft long and of the drop-bottom general service type. Total order is valued at approximately \$9 million.

Pacific Car & Foundry Co. at Renton near Seattle is engaged in a \$4½ million program to rebuild 1000 refrigerator cars for delivery in the East. This operation entails construction from the sills and trucks upward. This operation is on an assembly line basis and at the peak eight a day will be produced. In addition Pacific Car & Foundry will begin construction on 20 all-steel cabooses for the Alaska Railway at an average cost of \$11,000 a piece. Steel for these operations is reportedly coming largely from western mills.

Kaiser Co., Inc., Iron and Steel Div., admits supplying a portion of the plate and structurals being utilized in the national car building program but gives no specific figures. However, it is understood that this company has been asked to supply between 3000 and 4000 tons of plates and structurals for this program and most of that material will be scheduled for use in eastern plants.

OLUMBIA Steel Co., U. S. Steel Corp. subsidiary, likewise has not revealed its allocation on this program, but states that it is subject to dictation from the East in regard to quantity and grade and sizes. These withdrawals from production at Pittsburg and Torrance, Calif., are expected to be very small because the products rolled at these plants are readily available nearer the car builders in the East and freight cost on such shipments to the East would be excessive and can be more economically supplied by other U. S. Steel subsidiaries. However, there are rumors afloat, based on usually reliable sources, that in the overall program Columbia might be expected to supply as much as the Kaiser organization.

Bethlehem Pacific Coast Steel Corp. reports that so far there have been no demands on the production facilities of that company here in the West and whatever allocation has been made to Bethlehem Steel Co. will be handled by eastern producers of the company.

As was to be expected, the allocation of any material which will be used out of this region, has brought about criticism of the program by industrialists and this situation probably accounts for the refusal of steel producers to release figures on such shipments. Sales managers are already harrassed by the scarcity of those items needed for railroad car construction and do not relish further argument with would-be customers.

SEATTLE — As the strike of 14,800 members of Aaeronautical Mechanics Union (local 751, International Assn. of Machinists) against the Boeing Airplane Co. went into its third week the situation shaped up as a major test of the Taft-Hartley Law, and the National Labor Relations Act.

In an attempt to settle the Boeing strike, Cyrus F. Ching, director of the Federal Conciliation and Mediation Service, invited both the company and union to send officials to Washington for conference. Boeing president William M. Allen refused to attend, saying, "If the purpose is to bring . . . collective bargaining negotiations," the company was not interested. However, he added that the company would attend, "for the purposes of giving those present complete facts in support of our position that the strike is illegal."

The contention that the strike is illegal is based on Mr. Allen's claim that it is being conducted in violation of Section 8-D, of the National Labor Relations Act, which removes collective bargaining from a union and its members in the event of an illegal strike. On these grounds, Mr. Allen has claimed that the union can no longer bargain with the company, and he has refused to meet with union officials.

Mr. Ching immediately wired back that the Taft-Hartley Law provides that employers and employees shall participate "fully and promptly" when the federal media-



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media-

Ironing Tables

tion and conciliation service calls a meeting.

To this, Mr. Allen quickly replied by wire to Mr. Ching, that the meeting called by the director was in violation of the Taft-Hartley Act as it would "render meaningless the section of the law which protects an employer who is the victim of an illegal strike." Mr. Ching's policy, Mr. Allen stated would require the company to bargain with its illegally striking employees. Apparently that was enough for Mr. Ching as he sent Mr. Allen another wire stating, "The service does not have the authority nor the intention to compel the company to attend the meeting."

Earlier last week the Boeing Co. had filed suit against the local union and its International for damages caused during the strike, and stated the amount would increase if and as the strike continued.

The complaint filed in U. S. District Court, stated it was a suit for "violation of contract" under Section 501 of the Labor-Management Relations Act (Taft-Hartley Law), which makes unions responsible for their actions.

After 21 days of work stoppage the situation last week seemed as far from being settled as it was on the day the strike was called, so far as the union members are concerned. Just what the company's plan of action will be under the Taft-Hartley Law is now clear. At present no meetings are being scheduled with any bargaining agency, local 751 no longer has a contract nor bargaining rights, and the Boeing Co. is short 14,800 workers.

The company states that the plant is open and work is available for those who want it. Boeing officials claim they have received numerous phone calls from strikers wanting to get back to work, but whether they will cross the picket lines of local 751 remains to be seen.

 $I^{\rm N}$ odd contrast to the situation prevailing at the Boeing plant is the action taken recently by 8000 workers belonging to unions affiliated with the Seattle Building & Construction Trades Council (AFL) whereby they declined a $6\frac{1}{2}\phi$ per hr wage increase which had been assured them under a cost of living escalator clause.

The action was taken by the members of the affiliated unions because they "felt it was good business for the construction trades," according to Fred W. Smith, secretary of the council. Union officials pointed out that building cost has risen accessively and that people purchasing new homes and other construction are cost conscious and want to know what they are going to have to pay for their buildings before contracts are let.

A RRIVAL of approximately 15,000 tons of No. 1 heavy melting scrap from Adaka, Alaska, for delivery to Alaska Junk Co. is anticipated here with some relish by steel producers according to Harry Schwartz, company official. The material runs about 50-50 on prepared and unprepared.

This is one of the largest shipments to come out of Alaska and is scheduled for sale upon arrival.

Scrap continues to move into this area from other sources and mills have been able to build up small inventories against the rail strike which failed to materialize. Higher prices prevalent in this area this year are credited with bringing out more material and there have been but few complaints recently of shortages. Extensive ship-breaking operations in the Northwest are also credited with relieving the tight situation which prevailed 6 or 8 months ago.

L OS ANGELES—Belief that the same raw material standardization plan now in use by West Coast airframe manufacturers (THE IRON AGE, Apr. 29, 1948, p. 108) could solve many of the country's steel supply problems if adopted by other industries on a national scale was expressed here.

Glen Aron, head of Northrop Aircraft, Inc., engineering department and chairman of the West Coast standardization project of the National Aircraft Standards Committee, said that West Coast airframe factories are finding a successful solution to many of their steel supply problems through voluntary reduction of raw material varieties. Meanwhile most U. S. manufacturers are plagued by a chronic, prolonged shortage of steel.

Of the four materials covered by the standardization project—steel, stainless steel, aluminum, and magnesium—the greatest improvement in supply has bee nnoted in steel.

This improvement has been accomplished, Mr. Aron noted, despite the fact that steel was the most difficult of all the raw materials to standardize.

Typical of steel standardization problems was the necessity for settling on a single "gage standard" to be used in specifying thickness of sheet stocks. Investigation revealed countless "gage standards" were in use at the start of the project. By voluntary agreement, both airframe manufacturers and suppliers agreed to use a single gage standard, the American Standards Assn.'s B32,1 in specifying stainless steel sheets.

"If the airframe industry wishes further to improve the availability of steel there is a need for collaboration with other industries who use the same warehouses as a source of supply," Mr. Aron said.

"For instance, the petroleum industry has many problems in steel akin to those faced by airframe manufacturers. Both are concerned with the weight-strength ratios of steels. Suspending a string of tools down a hole a mile and a half deep is just as much a problem of metallurgical fatigue as is the design of supports for an aircraft engine," he pointed out.

Suspension Likely For Scrap Import Duties

Washington

• • • The House Ways and Means Committee has reported favorably on the bill (HR 6242) to extend the suspension of import duties on scrap until June 30, 1949.

"Large quantities of metal scrap, much of which came from the U. S. in the form of military equipment, is still to be found in a number of foreign countries," Rep. Grant, R., Ind., told the House. "The demand for iron, steel, aluminum and other metals in the U. S. is perhaps even more acute than in 1947. The temporary extension of the free importation of these materials is therefore deemed advisable, both from a standpoint of national security and for the satisfying of civilian demand."

Final passage and approval of the bill by the President are considered certain.

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DEPENDABILITY—The RB&W coldpunching process in itself insures a sound product, free from structural defect.

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Plants at: Fort Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

103 Years Making Strong the Things That Make America Strong

- Forrest E. Richmond has been elected vice-president of Revere Copper & Brass Inc., New York, and executive head of the company's Rome Div., Rome, N. Y. Mr. Richmond has been with Revere since 1908. He was formerly works manager of the Rome Div. L. G. Glesmann, assistant works manager of the Rome Div., has been appointed works manager there.
- Curtis A. Gordon has been named general works manager, Jessop Steel Co., Washington, Pa. He was formerly superintendent at the Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div., Buffalo. He has also been associated with Bethlehem Steel Co., Canton Alloy Co., Donner Steel Co., Rustless Iron & Steel Co., and Crucible Steel Co. of America.
- Frank G. Soule has been appointed purchasing agent for the general engineering department of National Lead Co., New York. Mr. Soule has been purchasing agent at the Sayreville plant for the titanium division since 1934.
- William C. Roederer has been appointed district manager of American Car & Foundry Co.'s St. Charles, Mo., passenger car plant. He had previously been assistant district manager at that plant.
- · George P. Lacy has been appointed manager railroad sales, Sheffield Steel Corp., with headquarters at Kansas City, effective June 1. He has been associated with Sheffield for 12 years. George P. McCracken, who has served under Mr. Lacy for the past 3 years, has been appointed district manager, San Antonio office, succeeding Mr. Lacy. Ernest Baxter, vicepresident of Sheffield Steel, will retire from official status on June 1 after more than 30 years of continuous service. Thereafter he will function in a consulting capacity.
- Thomas Nast has been elected president and treasurer of Kensico Tube Co., Mount Kisco, N. Y. He was formerly associated with Revere Copper & Brass Inc. for several years.
- Harry E. Thiele has been elected vice-president—manufacturing of General Steel Castings Corp., Eddystone, Pa., to take the place of Arthur R. Allard, who has resigned.

PERSONALS

· Lawrence F. Black has been appointed assistant chief engineer, American Steel & Wire Co., Cleveland. Charles B. Hull has been named assistant division engineer, construction. Mr. Black joined American Steel in 1924. Since 1945 he has been superintendent of engineering and maintenance at Duluth, which post he now leaves to assume his new duties. Mr. Hull started as a draftsman in the chief engineer's office in 1925. He was works engineer at the Cuyahoga works prior to his appointment in 1945 as chief draftsman in the engineering department, which position he has held up to the present



BURKE B. ROCHE, vice-president, Binks Mfg. Co.

- Burke B. Roche has been elected vice-president of the Binks Mfg. Co., Chicago. Mr. Roche, who has been with the Binks organization since 1939, was formerly in charge of the industrial division.
- Irwin H. Cornell has retired as vice-president and sales manager of the St. Joseph Lead Co., New York, after 38 years of service with the company. He will remain as a member of the board of trustees and of the executive committee. Charles R. Ince has been appointed sales manager to succeed Mr. Cornell. Mr. Ince joined St. Joseph Lead Co. in 1929 as assistant to Mr. Cornell.

- R. M. Worth has been made vicepresident in charge of sales of the Worth Steel Co., Claymont, Del., to succeed the late Paul M. King.
- James J. Ryan has been appointed to the newly-created position of manager of gypsum, lime and steel products sales of National Gypsum Co., Buffalo. He has been with National Gypsum since 1934 as manager of metal lathe sales.
- A. B. Vestal has been appointed to the management staff of Firth Sterling Steel & Carbide Corp., McKeesport, Pa. He formerly worked as a power and fuel engineer at Jones & Laughlin Steel Corp., and during the past 8 years served as head of industrial engineering of both the Farrell and Duquesne plants of Carnegie-Illinois Steel Corp.
- R. W. Roush has been named chief materials engineer for Timken-Detroit Axle Co., Detroit. He has served as chief metallurgist since 1935. Mr. Roush will be responsible for all materials and processes and will direct the activities of all company laboratories. F. E. Johnson, for 5 years assistant chief metallurgist, has been appointed chief metallurgist of Detroit plants. He will be in immediate charge of Timken-Detroit metallurgical and chemical laboratories.
- Charles R. D'Olive has been appointed vice-president and general manager of the newly-created Ingersoll Utility Unit Div. of Borg-Warner Corp., Chicago. Mr. D'Olive was for many years manager of the appliance division of Stewart-Warner Corp. During the war he was president of Frederick Hart & Ca at Poughkeepsie, N. Y.
- Philip A. Bohlander has been appointed assistant works manager of the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
- Karl M. Greiner, general sales manager of Packard Motor Car Car Detroit, has been appointed vice president. He has been with Packard since 1943.
- Albert B. Willi, Jr., has been appointed assistant chief engineer in charge of sales engineering, Federal-Mogul Corp., Detroit. He has been associated with the engineering department of Federal-Mogul since 1937.

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Chemistry is held within proper range for best heat treatment response.

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Annealing is controlled for the ideal spheroidia

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Physicals are uniform throughout every shipment.

Because of its consistent precision characteristics, CMP carbon and alloy spring steel offers important advantages to both your production operations and your finished product. CMP pioneered precision strip processing techniques and has maintained leadership in rolling and annealing advancements that assures unvarying accuracy to all specifications in coil after coil. It makes certain that you can always achieve the spring you want when CMP Thinsteel is specified. Let CMP experts help you with your spring steel problems. Phone or write today.

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THE IRON AGE, May 27, 1948-113

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European Letter . .

• Was Russian broadcast diplomatic blunder or brilliant stroke of political warfare . . . Truman states there is no new departure in American policy . . . Dangerous public diplomacy should cease.



ONDON—One would like to know whether the Politburo is now reproving its Foreign Affairs Commissar for a diplomatic blunder or congratulating him on a brilliant stroke of political warfare. By rudely broadcasting to the world recently a statement of Russian policy which had been handed to the American Ambassador in Moscow, Mr. Molotov has provoked a depressing series of diplomatic "no bids."

Mr. Truman says there is "no new departure in American policy," Mr. Marshall denies that he has any wish to discuss alone with Mr. Molotov matters affecting other nations, and Mr. Bevin insists that the ground should be cleared before new talks are attempted. To achieve this much in 48 hr is indeed a feat—whether of clumsiness or skill.

It may have been calculated in Moscow that a diplomatic sensation would help Mr. Wallace in the presidential elections, or that the sails of Western Union might begin to flap if the wind blew less steadily from the east. Or Mr. Stalin's advisers may have seen in the full and frank reminder of American policy presented on May 4 an attempt to score a point in the cold war. Or, indeed, it is just possible

that Mr. Molotov mistook General Bedell-Smith's aide-memoire for a billet-doux.

Whichever may be the correct explanation, the hopes that were aroused have been quickly dashed. Having explained to Moscow that the shape of a bipartisan American foreign policy is set, and that it will be modified only in response to a change of tone in Russian policy, Mr. Marshall has now to persuade a disappointed Europe that a desire for general conversations is no new feature of the policy of the Russians, and that they could better express their goodwill, in more than one capital or committee, by action instead of words.

But Mr. Marshall is entitled to expect that there should be no suspicion or resentment in London or Paris or Brussels about his single-handed and secret approach to Mr. Molotov. A joint approach would have been regarded in Moscow as tantamount to a threat; a public gesture would have been treated as a challenge or ignore. General Bedell-Smith's memorandum was well-timed, carefully drafted and free from any taint of appeasement.

I is not easy to do justice to the spirit of the argumentative Russian reply, because its version of postwar international history is the usual Marxist fantasy. It is friendly—by the standards of 1948—in so far as it speaks of the "positive attitude" with which the Soviet government receives the American assurance that "the door always re-

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mains open for discussion and settlement of our differences." But the Russians at once aroused suspicion of their good faith by interpreting it as "the proposal to begin . . . a discussion and settlement of the differences between us," and by then broadcasting the distortion to the world in the midnight hours.

As for the American statement, there is a significant sentence which has escaped notice. Referring to attempts by Communist minorities to seize power and establish "regimes subordinated to foreign interests," it declares that, if these attempts ceased,

then the necessity for certain manifestations in the foreign policy of the United States which evidently cause dissatisfaction in Moscow will be eliminated.

That is a broad and promising hint of possible concessions. There is no counterpart to it in the Russian reply, save the general suggestion—by no means a concession—that Russia would be interested in a program of European economic recovery outside the limits of the Marshall Plan. This is hardly the way to appeal to Mr. Marshall.

THE public airing of the two government's statements will have done a little good to the American and Russian publics. But in Europe it will have done great harm, by encouraging the appeasers. If any progress towards negotiation and settlement is now to be made this dangerous public diplomacy should cease. It is no good Mr. Marshall's pointing to the UNO council table. That method has been tried with the Russians and has failed too often. There should be negotiations through diplomatic channels, with the most careful preparation and without popular expectation of quick results. For the general agreement which is-and always has beenthe objective of British and American policy may take years to achieve.

Meanwhile, the measures taken to strengthen the West—political and military as well as economic—must go on swiftly and steadily, just as the consolidation of the east European bloc will go on. The condition of reaching, let alone maintaining, a general settlement between Russia and America is to achieve a new balance of power in Europe.

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frankly, we may be unable to accept new business now, but looking ahead, we would like to keep you informed out our expanding facilities.

Now under construction . . . a big, new cold rolled strip mill in New Haven, Conn., scheduled to begin rolling by October 1, 1948 . . . to give Eastern customers 60,000 tons additional producing capacity . . . practically at their stockroom doors.

Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

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General Office: 1025 South Oakwood Ave., Detroit 25, Mich. Plants: Chicago, Cleveland, Detroit, Lyndhurst, N. J., Worcester, Mass. Sales Offices: Grand Rapids, Indianapolis, New Haven, Philadelphia, St. Louis, Toledo Products: SHEETS—Hot Rolled . . . Hot Rolled Pickled . . . Cold Rolled . . . Lang Terne . . . Galvanized; PLATES; COLD ROLLED STRIP STEEL—Cails and Cut Lengths . . . Slit or Round Edge . . . All Tempers.

DISTRIBUTORS AND DIRECT MILL REPRESENTATIVES .

Warehouse and General Office: 8701 Epworth Blvd., Detroit 4, Mich. Sales Offices: Grand Rapids, Toledo, Indianapolis Products: Cold Drawn and Hot Rolled Carbon and Alloy Steel Bars . . , Tool Steels . . . Drill Rod . . . Wire Rope, etc.

Industrial News Summary...

- · No Early Letup Seen in Steel
- · Basing Point Fight Gets Hot

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Scrap Market Shows No Change

ALMOST 3 years after the end of the war there is no end in sight for the current strong steel demand. This week there was little chance that steel consumers would see a buyers' market for at least a year or longer. While steel users tried to figure out where to buy the cheapest steel from mill sources there was an even chance that a coal strike in July or sooner would lose more steel.

Since the war ended more than 20 million net tons of steel ingots have been lost due to strikes. Had it been available for the history making steel demand which has been strong despite the periodic crystal ball gazers' guesses of an iminent balance the clamor for steel this week would be at a normal pitch instead

of a healthy roar.

Demand for more steel capacity which has been argued pro and con for 2 years or more is expected to be spotlighted more strongly now that steel will be harder to get. The European Recovery Plan and domestic defense requirements will furnish the backdrop for renewed arguments. But it will be mostly a battle of words. Present capacity can not be fully utilized. Coal and ore are problems now. Also steel mills haven't had a long chance to exploit all of their existing capacity—the Spring or Summer coal strikes have prevented that.

In the next 2 years total steel capacity of the country may approach 97 million tons—only a short distance from the goal demanded at various times by governmental critics of the steel industry. But by that time the face of the steel industry may be so changed because of the basing point controversy and high freight rates that a little matter of capacity will be small potatoes.

TWO mills in the past week or so have begun selling products on an f.o.b. mill basis. One mill in the middle west has done so because freight rates make further freight absorption too costly for that company. The other firm has gone to an f.o.b. mill basis on hot rolled sheets in order to make sure that its sales do not involve the payment of freight charges not actually incurred—in other words no phantom freight charges.

But the entire steel industry has not gone to an f.o.b. mill system. It probably will not do so unless forced by a Supreme Court decision specifically aimed at steel. As long as steel demand outweighs supply it is the mills' best interest to sell at a base price plus freight—a method that is similar to an f.o.b. mill system. When lean days come there is little chance that any steel mill will let business pass them by—no matter what sales method is used.

There was little doubt this week that the steel industry is in for major changes in selling practices. Unless Congress should pass laws supporting the multiple basing point system, that method of selling is out in steel—at leat that is the opinion of some steel lawyers and steel officials. But the fight will go to the

bitter end because steel people honestly think that the present demands of the FTC on steel firms are erroneous, lack practical knowledge of the steel industry, are theoretical and are dangerous to the free flow of steel to users throughout the country. Time will prove who is right—according to law.

Steel users this week were more confused pricewise than they have ever been in their lives. There was no rhyme or reason to the crazy quilt of steel prices at major centers. Some prices were lower than others depending on who the supplier was. In some cases freight was being absorbed on distant hauls—in other cases it wasn't.

CONSUMERS were working overtime studying possible future locations and their relation to adequate and cheap steel. But it was not all so simple to figure out. The general observation that it would be advantageous to be located in a steel mill area was only a half truth. The steel consumer was rapidly finding out that his distance from his consuming market played as big a part as his nearness to a steel source.

Then he was being plagued with conjectures as to what will happen when demand falls off and steel is easier to get—will the mill equalize freight?—can he get what he wants where he is?—will his purchases be individual affairs and a host of other unanswered questions.

There was more than a chance that the wholesale movement of steel users to steel producing areas would not materialize. But there was a certainty that steel costs had become so high that even in cut-throat days to come mills would think twice before absorbing too much freight. That plans for eastern mills will be pushed and restudied is a certainty just as is the close scrutiny to be placed on equipment and steel mills too far from customers.

The only consolation the steel industry had this week was the steadiness in the scrap market. With warmer weather here and no sharp increases in price, no one looks for a higher scrap price level. Many are looking for lower prices—they may look in vain, yet some brokers and dealers may again yield to the pressure of steel mills which are trying to support their price cuts with lower steel making costs.

There was no sign this week that steel firms were happy about the anti-inflation results of steel price cuts. So far there has been no general decline in the price of items used by the steel industry and no general decrease in the costs of living for steel workers. But steel officials who put thir faith in this unprecedented move ask for pationce, caution and a chance to see what happens in a few more months. If nothing does happen Philip Murray's position in next year's steel wage negotiations will be too strong for another "no"—if not before that time.

The steel rate this week is up ½ point to 95.5 pct of capacity.

that he intends to bring up the pension problem at coal negotiations when they are resumed. If he does this it may give the lawyers a field day for interpretations. The miners may finally strike over the pension controversy instead of the battle over who attends the meetings. If that is the case and the walkout does not come until 80 days after the injunction was slapped on in April it may be that the government can 'do nothing because of the Taft-Hartley Bill have been respected. It will then be the job of President Truman to go to Congress—the government can not again use an injunction if the strike is over the same thing which called forth the original halt order—providing the strike does not happen until the 80 days are up.

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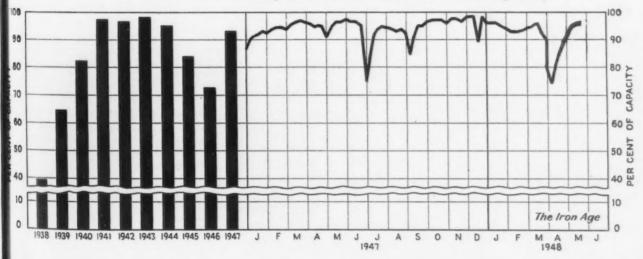
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- BASING POINTS—First formal recognition by Congress of the possible effect of the outlawing of basing points came on May 20 when Sen. Cpaehart, R., Ind., asked the Senate to put up \$14,000 for an inquiry covering the Supreme Court's decision in the Cement Case. Present and potential repercussions on business generally would be examined by the Senate Commerce Committee between now and Mar. 15, 1949, under his proposal.
- SCRAP TALK—Steel and scrap industry officials feel greatly encouraged over the possibility of getting additional scrap out of Germany as the result of the position taken by newly-appointed Commerce Secretary Charles A. Sawyer at a meeting of the Interdepartmental Scrap Committee last week. Mr. Sawyer took a strong stand on getting some of the 10 million German scrap surplus to this country. He emphasized that this quantity should be ample to supply European needs with a substantial quantity left over for the United States.
- F.O.B. MILL PRICES—Effective May 15 Wisconsin Steel Co. announced that the sale of all iron and steel products they make will be sold on an F.O.B. mill price. Last Feb. 3 this mill put all alloy products on this basis. Officials of the company told IRON AGE this move has nothing to do with FTC rulings on basing points, but was simply a matter of not being able to absorb the losses of having to pay present freight rates.

- WRY NOTE—"I predict trade associations are out," Federal Trade Commissioner Lowell B. Mason declares, "if the laws stand as they are now." Mr. Mason bases his prediction on the present trend in court decisions placing greater reliance on original decisions by agencies of the Federal Government. "Hazards of membership will hardly be worth any legitimate advantages," Mr. Mason states. "I can see nothing but a decadent economy controlled by an aggressive central government." Mr. Mason also predicted that Congress would never legalize any price fixing system regardless of the effect of the outlawing of basing point price systems.
- SALES SUGGESTION—Carnegie Illinois Steel Corp. increased its shipments of high strength low alloy steels by 80 pct last year, according to Thomas J. Hilliard, sales vice-president. Mr. Hilliard estimated that at least half of the industries handicapped by the sheet and strip shortage could ease their production problems by using more of this type steel.
- FAST WORK—A major re-lining and improvement of the Canton blast furnace, Republic Steel Corp., was completed last week in what is believed to be record time for the amount and variety of work involved. The furnace was blown out on April 3 and relighted May 14. The work was performed in 41 days and 5 hr from blow-out to relighting. All firebrick was torn out and replaced, a carbon hearth installed and a large amount of steel construction undertaken. The furnace has a rated capacity of 235,000 tons per year and provides hot metal for Republic's alloy steel plant.
- NATIONAL CUTS—Ernest T. Weir, chairman of National Steel Corp., has announced price reductions which, on an annual basis, will amount to \$4,600,000. The new prices were effective May 15. They are equal to an average of \$1.50 per ton on the company's shipments of finished products, estimated at about 3 million tons in 1947. In addition to previously announced tinplate price reductions of 10¢ per base box, it is understood that cold-rolled sheets and strip have been cut \$2 a ton to 3.66¢ per lb delivered in Detroit and to 3.45¢ per lb Pittsburgh base.

Steel Ingot Production by Districts and Per Cent of Capacity



tek of	-	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohie River	St. Louis	East	Appregate
**********	99.0*	93.5	92.0*	90. 0	99. 0 *	93.0	104.0*	102.0	* 102.0	87.5	99.0	78.0	98.0	95.0
	98.5	94.0	93.0	90. 0	95.0	93.0	104.0	102.0	102.0	94.0	99.0	84.0	98.0	95.5



with JBL OTISCOLOY

CORROSION-RESISTANT HIGH-TENSILE STEEL



Famous Boat Builder Shatters Tradition with Otiscoloy Steel Construction

By building standard models, employing mass production-line methods, and using J&L Otiscoloy High-Tensile Steel, Churchward & Co., Inc., of West Haven, Conn.—the "Ford of the waterways"—offers a type of construction to the small boat field that heretofore has only been available in large naval and commercial craft and in custombuilt yachts.

Because Otiscoloy is highly resistant to abrasion and corrosion—and 35% to 40% stronger than mild steel—Steelcraft obtains strength with light weight, safety and life-time

durability at surprisingly low cost.

Efficient, beautiful streamlining is easily accomplished, because of the excellent workability and ripple-free flatness of Otiscoloy sheets.

Assembly of Steelcraft cruisers is facilitated because welding is fast and may be done by any process.

Many other fabricators are finding J&L Otiscoloy equally advantageous. It reduces expensive deadweight. It can be formed hot or cold, welded, forged, flame-cut or otherwise worked by standard methods. Its ability to hold paint and to withstand wear, abrasion and corrosive elements is remarkably high.

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If you are not acquainted with this modern steel, call your nearest J&L sales office, or write us today for a copy of "Otiscoloy High-Tensile Steel." This booklet contains data on properties, weights, elements of sections and forms available. The coupon is for your convenience.

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1	403 Jones & Laughlin Building
1	Pittsburgh 19, Pa.

Please send at once a copy of your booklet: "Otiscoloy High-Tensile Steel."

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JONES & LAUGHLIN STEEL CORPORATION

Raise in Steelworkers Dues Anticipates Need for 'Emergency' Chest

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f your Steel." • • • The United Steelworkers of America have served notice on management that they are not taking the rebuff to their recent wage request lying down. At their fourth annual convention here recently they voted to increase their monthly dues from \$1.50 to \$2.00. This has already been enterpreted by some observers as a union declaration of intent for 1949.

When resistance to the proposal began to develop among the 3000 delegates. President Phillip Murray, who usually concludes debate, took the floor early and declared that "there are 107,000 members of your organization whose contracts are due to expire before December of the present year . . . Your international organization will be required, under those circumstances, to contribute its might toward the maintenance of the people who may be idle as a result of the strikes which they might be forced into during the current year."

Other reasons cited for increasing the dues were to assist with the further organizing of steelworkers and to aid other unions which were striking. The dues collected are divided equally between the international organization and the various locals.

Another highlight of the convention was the dramatic declaration of war against the Taft-Hartley Act. The legal battle is expected to focus on the constitutionality of two main issues: (1) The use of union money to try to elect or defeat political candidates and (2) The filing of non-Communist affidavits, which are a pre-requesite of obtaining use of the facilities of the National Labor Relations Board.

The union case against the first point has already been won in a lower court and is now before the Supreme Court. The test was brought about when Mr. Murray caused a political statement to be published in the CIO News, publication of which is supported by union funds. If the highest tribunal should overrule the decision of the lower court, Mr. Murray would be subject to a fine of \$1000, a year's imprisonment, or both.

The matter of non-Communist

Phil Murray Warns of Pacts To Expire This Year; Says Union Must Be Ready

By BILL PACKARD

Associate Editor

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affidavits was referred to the executive committee, after debate by the delegates. The executive committee adjourned without acting on the issue. This, in effect, was a goahead signal to Mr. Murray's avowed intention "to test the validity of that provision of the act which requires the filing of affidavits."

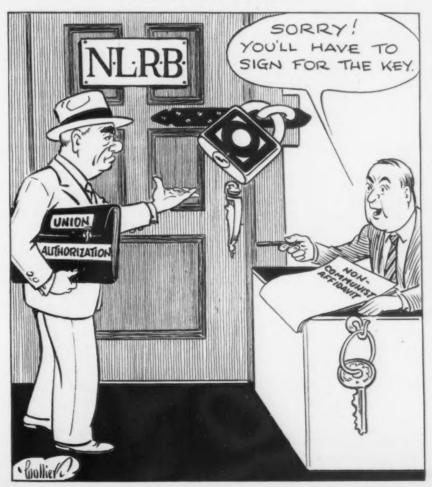
The union agreed to file the fi-

nancial affidavit requirements so that a clear cut decision could be reached on the non-Communist affidavit issue. The real difficulty on this point, Mr. Murray told the delegates, is to get the issue before the courts. He said that it was hard to find a means to violate this requirement. Presumably this is because the penalty for non-compliance is negative rather than positive (facilities of NLRB are denied to non-complying unions). It hurts. But it doesn't bring court action.

The delegates were told that an attempt would be made to test this issue in connection with the Inland Steel Case. In the Inland Steel Case the NLRB (1) ordered the company to bargain on pensions (2) provided the union qualified under all the registration provisions of the act within 30 days.

Opposition to this requirement

"To Be Or Not To Be . . ."



on the part of the steelworkers union has been based largely on a matter of principle, since the union does not have a Communist problem within its ranks. Mr. Murray declared that "a Congress which requires an individual to file with the Government his political affiliation before he is entiled to or given the privilege of representing the workers whom he has been elected to represent—can go to any extreme, and I speak now as a matter of principle."

The very mention of the word "Communist" or "Communism" brought repeated, spontaneous demonstrations from the assembled delegates. An interesting sidelight occurred when one delegate, who took the unpopular view, landed outside in the gutter-after he had been accorded the microphone to air his views. The constitution of the union was amended to prohibit Communists from holding union offices. This was regarded as a psychological move to strengthen the union in its impending legal battle on this issue.

The report of failure in the recent wage bargaining was accompanied by a stir of restlessness on the part of some of the delegates. Of interest to industry, on the other hand, was Mr. Murray's pledge to honor the existing contract. "I am cognizant of the fact that agreements are made to be kept," he declared, "and I am one of those who throughout life have religiously maintained that a contractual commitment is a sacred obligation and that one must keep it."

At another point in his keynote address Mr. Murray blasted at industry profits, and contended that the recent price cuts were "a mess of psychological sop offered the American people to help the industry . . . to overcome much of the bad publicity it encountered in February 1948 when it increased the price of semi-finished steel. . . ."

In referring to the wage negotiations, he said "The companies made a decision, and in substance that decision was that we don't think a wage increase will be good for you at this time." He said that, in the course of the bargaining, no representative of the industry denied the fact that living costs in the course of the past few years had reached "extraordinary proportions."

Mr. Murray also (1) called for support of ERP, (2) attacked the

use of injunctions to stop strikes and (3) blamed the Communists for the formation of a third party in the United States.

When the question of endorsing a candidate for president was presented to the delegates, they voted to refer the matter to the executive committee for decision at a later date.

J & L Wins Restraining Order Against Gray Market Steel Broker

Chicago

• • • J & L Steel Co. won a temporary restraining order against Howard Kimble, gray market broker, in the U. S. Federal Court hearing held here May 18. The order forbids the defendant to use J & L's name in any further deals. The damage suit trial of \$100,000 against the defendant will be reopened on Sept. 20 at which time J & L can present further evidence to substantiate their claim.

Another broker, A. A. Schultz of Chicago, was brought into the case after Mr. Kimble had earlier testified that Mr. Schultz was the man who allegedly had 10,000 tons a month of J & L ingots for sale. Mr. Kimble claimed he had been instructed by Mr. Schultz to solicit orders for ingots with the orders made out to the steel company. These orders were to be sent direct to Mr. Schultz. Mr. Schultz, when brought before the court, categorically denied Mr. Kimble's statements.

Correspondence between Schultz and J. J. O'Donovan, another broker with offices in the Carlton Hotel in Washington, D. C., were subpoenaed by the court and introduced as evidence. These letters offered the above ingots to Mr. Schultz at mill price. Mr. Schultz was to get 25 pct of the resultant sheet tonnage, plus \$1.00 a ton if he could arrange the rolling time of the ingots at any mill. Mr. Kimble, it appeared, misunderstood Mr. Schultz's alleged instructions, as he should have been selling sheets.

Mr. Schultz testified that the Pennsylvania Exchange Bank of New York City was used to ascertain if O'Donovan, Inc. actually had or could get ingots. The bank, according to Mr. Schultz's testimony, reported the O'Donovan offer appeared valid. No steel was sold by

any of the brokers in this deal. It was evident to steel market observers present at the trial that the whole affair was another gray market merry-go-round episode.

Mr. Schultz testified that during 1947 he did \$100,000 worth of steel business. When asked by the company's attorney how much he made per ton, Mr. Schultz replied \$5 a ton was his standard commission. He further testified that during the early part of May he had sold nails at \$8.75 a keg to the Babcock Lumber Co. of Pittsburgh.

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The Chicago sales department of the company had previously secured copies of a steel consumer's orders for 2000 tons of ingots issued at Mr. Kimble's solicitation to the J & L Steel Co. The orders were not sent to J & L but to one of the brokers.

Judge Michael Igoe, in issuing the restraining order said, "It is quite apparent that everybody in this lawsuit is not telling the truth. It does reveal, however, one of the saddest aspects of the economic life of this nation at the present time. We have in this picture today two very minor figures; Mr. Kimble and Mr. Schultz don't mean anything in this picture. They are the most minor figures who appear in it, but here is a challenge to the steel industry. I am going to issue this injunction. I am going to continue this case.

"There has been enough revealed here today to give this steel company, if it is sincere in this matter, and to give the steel industry if it is sincere in this matter, an opportunity to pursue this inquiry. Here they have the names of the banks, they have the names of the bankers, they have the names of people who are wealthy enough to reside in the Carlaton Hotel in Washington, D. C. They have a suggestion made as to where they can find letters and telegrams.

"Now, if they want to pursue this inquiry, it is shifted from this court and it is shifted away from these two very minor factors in this unsightly picture, and it is placed right on the shoulders of the steel industry.

"That is the challenge that is thrown out to them, and if they want to clean this thing up, they can accept that challenge and go ahead and do a cleaning job. This injunction will be issued, and this matter will be continued for further hearing until sometime in September."

Nonuniform Prices and Shortages Tax Ingenuity of Warehousemen

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• • • Nonuniform mill prices and the shortage of warehouse steel products were the two problems uppermost in the minds of the warehousemen who met here for the annual meeting of the American Steel Warehouse Assn.

Warehousemen were in a quandary over their price schedules due to the confusion reigning in mill prices for many products at major basing points. There was no basis for stabilization of warehouse prices at the time of the meeting, nor has any appeared since.

Some warehouses have had a relatively simple problem of adusting their schedules to the new mill prices. These are the subsidiaries of the principal mills who are able to obtain the bulk of their requirements from the parent mill. Nevertheless, at least one such warehouse has been forced to make a revision of its price of floor plates in the East.

The problem of the independent warehouse is much more complex, as it usually involves steel shipments from several sources. Many independents, particularly in the Midwest where the basing point prices are so confused, have not yet adopted a new price schedule, preferring to wait until the price situation is a little better clarified. Some independents revised on the basis of the Corporation's schedule and some are now regretting their hasty action as they must absorb price differentials on some products.

The whole problem of conflicting warehouse prices is a sensitive one to the industry and in some instance warehousemen prefer to leave the discussion of the problem to their home office executives. As far as the consumer is concerned, he can no longer be sure of firm and uniform steel warehouse prices for any product at this time. But as one warehouseman puts it, "the consumer doesn't give a damn for price differences so long as he can get the steel and doesn't have to pay gray market prices for it."

Detroit steel prices are particularly confusing because of the dropping of the arbitrary price base by some mills shipping there. It is

Some Haven't Yet Adopted New Price Schedules; Others Regret Doing So

By JOHN ANTHONY

Eastern Regional Editor

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understood that there are five price levels for cold-finished carbon bars there.

In the East the major benefit to consumers in recent price announcements was the establishment of the Sparrows Point base for cold-rolled sheets. To warehouse consumers, this represents an advantage of \$3.50 a ton for the sizes produced there, estimated at an average of \$2 a ton for all cold-rolled sheets.

The prospects for steel warehouse supplies under the impact of the requirements for the rearmament, Economic Cooperation Administration and other priority programs were forecast by David F. Austin, vice-president, United States Steel Corp. of Delaware when he estimated that 17 million tons would be required by them

(CONTINUED ON PAGE 122)

50 TEARS AGO

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THE IRON AGE, May 26, 1898

Secretario de la constitución de

- "Serious riots have occurred in a number of Italian cities. In Milan about 1000 persons were shot down by the troops in quelling an outbreak. Martial law has been proclaimed in several parts of Spain, where the public excitement over the Manila defeat has reached an acute stage. The downfall of the Spanish ministry is imminent, with a possibility of the establishment of a military dictatorship."
- "Andrew Carnegie has made a proposition to give \$210,000 for a public library and town hall for Carnegie borough, near Pittsburgh. The proposition will probably be accepted."
- "The demand for wood working machinery has seen its best days in the Northwest. The great pine forests have disappeared and no longer are extensive shipments of machinery being made to lumber companies. On the contrary, much

- machinery has been thrown on the market from this region, depressing the trade in new machinery in other parts of the country."
- "The Missouri mule dealers who formed a trust and put the price of mules up 50 pct, have been thwarted by the Army who rejected all their bids. The trust has been broken and mule dealers are rushing to get bids in at normal figures."
- •"The American Federation of Labor acted commendably in deciding not to force the issue this year on the adoption of the 8 hour working day. The contest was to open up on May 1 with the machinists taking the initiative. It was deemed inadvisable and unpatriotic at this juncture to precipitate such a struggle. It is to be hoped, however, that the matter has not merely been deferred a year, but indefinitely postponed."

Industrial Briefs . . .

- GROUP OFFICERS—John J. Lincoln, Jr., director of sales service, Air Reduction Sales Co., New York, has been elected president of the International Acetylene Assn. A. J. Fausek, president, Modern Engineering Co., St. Louis, was elected vice-president.
- AWARD WINNERS—The Steel Founders Society of America recently announced the following awards to members: Technical and Operating Medal to Charles L. Heater, vice-president and director of American Steel Foundries, Chicago, and the Lorenz Medal to Edgar D. Flintermann, president, Michigan Steel Casting Co., Detroit.
- JET ENGINE CENTER—A \$25 million center at Lynn, Mass., for the development, testing and production of aircraft jet engines has been announced by General Electric Co.
- AMA PRESIDENT Lawrence A. Appley, former deputy chairman and executive director of the War Manpower Commission, has resigned as a vice-president of Montgomery Ward & Co., Chicago, to succeed Alvin E. Dodd as president of the American Management Assn. Mr. Dodd, AMA president for the past 12 years has been elevated to the newly created post of honorary president.
- SCHOLARSHIPS—Ten outstanding high school seniors have been awarded George Westinghouse scholarships, sponsored by the Westinghouse Educational Foundation, valued at \$2200 each, to be applied toward an engineering education at Carnegie Institute of Technology, Pittsburgh.
- PLANS OPEN HOUSE— The Weirton Steel Co. is completing plans for a 3-day open house for its Weirton, W. Va. and Steubenville, Ohio, plants to be held June 8-10.

- NEW BRONZE ALLOY—A new aluminum bronze alloy especially engineered for use in forming and drawing dies, has been announced by Ampco Metal, Inc., Milwaukee. Known as Ampco Metal Grade 24 it is a hard, strong wear-resistant bearing metal. The new material has two to five times the life of other bronze dies before redressing and many times the life of steel dies.
- DISTRIBUTOR The Fairmont Aluminum Co., Fairmont, W. Va., has announced the appointment of Sueske Brass & Copper, 13 N. Peoria St., Chicago, as warehouse distributors for their products and as sales representatives of the mill, covering the states of Illinois, Indiana, Wisconsin and part of Michigan.
- MERGES—Tonawanda Iron Corp., Buffalo, wholly-owned subsidiary of American Radiator & Standard Sanitary Corp., was merged with the parent company and has become the Tonawanda Iron Div.
- BRASS ROD DEPOT—Titan Metal Mfg. Co., Bellefonte, Pa., has announced the opening of a new mill depot at 1410 Madison Ave., Indianapolis, fully stocked with brass rods. Samuel D. Rhinesmith will be in charge.
- ACS MEDAL—The Western New York section of the American Chemical Society has awarded the 1948 Jacob F. Schoellkopf Medal to Marvin J. Udy, Niagara Falls chemical and metallurgical consultant, for his development of methods of plating materials with cadmium and chromium.
- TO HANDLE EXPORTS— The Borg-Warner International Corp. has announced that it will handle the export activities for automotive products of the Hoover Ball & Bearing Co., Ann Arbor, Mich.

Warehouse Meeting

(CONTINUED FROM PAGE 121)

next year as compared with the 14 million tons they now require. He broke down his estimate as follows: Freight cars, 3 million tons; ECA, 2 million; export, 3 million; balance for the Army, Navy, Maritime Commission and some others.

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A question on the significance of the cement case decision to the steel industry asked by Harvey Bradley of W. J. Holliday & Co., Indianapolis, was not answered by Mr. Austin.

An increasing number of new warehouse firms established during the last few years, particularly in the smaller steel distribution centers, was reported by Walter S. Doxsey, association president. He attributed the trend to the effect of advancing freight rates, particularly the increases in the differentials between carload and less carload rates which have circumscribed warehouse marketing areas. He reported that some warehouses no longer equalize the transportation charges on shipments back toward mill basing points. This trend toward smaller marketing areas would continue, he predicted, and would be accelerated by the movement of large industries from cities to the open country.

The effect of current mill pricing methods in which extras may run to 25 or 50 pct of the base price, may require a revision of warehouse pricing methods, Mr. Doxsey said. Under the warehouse practice of passing along extra charges without compensating adjustments in margins or spreads, such high extras bring down the overall profit margin. He said that warehouse profits have declined about 16 pct.

Briggs Net Income Up

Detroit

• • • Briggs Mfg. Co., Detroit, has reported a net profit for the first quarter of 1948 of \$2,044,936 compared with \$1,408,580 in the first quarter of 1947. In addition to a steady demand for its automobile products, Briggs noted the growing acceptance of its plumbing ware by the building industry.

W. D. Robinson, president, said Briggs is now feeling the effects of the decline in steel production during the recent coal strike, "This is our No. 1 problem," he said.

OIC Requests 8 Million Tons of Steel for Voluntary Allocations

Washington

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• • • The Office of Industry Cooperation has finally submitted to the steel industry its estimate of the total domestic steel requirements under the voluntary alloca-

tions program.

At a meeting last week with the Steel Producers Industry Advisory Committee, OIC officials pointed out that the best available information indicated that slightly more than 8 million tons will be needed for domestic programs in the 12month period beginning July 1. The industries covered are now getting about 6 million tons on an annual basis according to OIC.

Broken down, the estimates presented to the industry are as fol-

Freight cars	3,000,000	ton
Petroleum, oil and		
gas plates, sheet		
and bars only	3,000,000	66
Farm machinery	1,230,000	46
Heating equipment		
for housing	318,000	64
Other housing	400,000	6.6
Atomic energy	160,000	64
Barges for Inland		
Waterways Corp.	176,000	66
Total	8.284,000	66

OIC officials point out that this estimate does not include any requirements for steel for defense needs which may be presented later. However, defense needs for steel no longer present a frightening picture to OIC and it is believed that they can be met by voluntary means, provided proper legal clearance can be obtained. The same can be said for steel requirements for ERP.

OIC also commented favorably on a steel industry request to have all government steel needs channelled through one agency. The industry wants to eliminate direct requests from a handful of agencies, such as Interior, Air Force and Navy. In addition, OIC agreed to discuss with the Attorney General the legality of meeting steel needs of municipalities within the framework of the Voluntary Allocations

The Steel Producers Committee also approved the earlier recommendations of the Steel Products Advisory Committee that 160,000 Industries Covered Getting About 6 Million Tons Per Year Now

By GENE HARDY Washington Editor

tons be made available to the Atomic Energy Commission and an additional 212,000 tons be supplied to warm air furnace industry (THE IRON AGE, May 13, p. 123). These programs cover an 8-month period beginning July 1.

The Producers Committee also resubmitted to the Products Committee for further study the request for 58,000 tons of steel for all-steel prefab houses. The Products Committee had turned down this request on May 6, but government prodding brought about the agreement to reconsider.

The Senate Small Business Committee, meanwhile, alarmed over reports that the Administration's voluntary allocations program isn't all that it's cracked up to be, this week continued its investigation of

Committee probers realize that their investigation must be handled skillfully. The lack of progress in arriving at voluntary allocations within certain industries is due to reluctance on the part of OIC officials to make the law work, they claim, and not to the fact that mandatory controls, and not voluntary controls, are what the economy needs.

Senator Wherry, R., Neb., committe chairman, in questioning John C. Virden, OIC director, as to how he "felt" about the voluntary program, left no doubt that some members of Congress feel OIC has not made a whole-hearted attempt to make the program work.

Asks Faster Increase In Furnace Capacity In Public Interest

Washington

• • • Unless the steel industry takes immediate steps to increase its productive capacity at a faster rate, some other means must be found to do the job in the public interest, according to a private report issued by Robert R. Nathan, former deputy director of the Office of War Mobilization and Reconversion.

Industry has completed or has programmed an additional 5 million tons in new facilities since the war, Mr. Nathan estimates. This, he charges, adds no new capacity but merely cancels that lost during the same period.

"If the expansion of facilities is to be left to the decision of the steel companies," Mr. Nathan declares, "it appears that our capacity to produce steel will not be increased sufficiently to meet our needs over the next few years."

Three major sources of demand are given to show the need for expansion-rising demand for durable good because of high employment and income, export demand

(including ERP), and the prospective need for peacetime defense program. More production is needed to provide price competition, it is added.

Export demand will extend over a number of years, the report holds, assuming that when European prewar facilities have been restored production will still fall short of growing foreign needs.

Other than estimating that present production is at least 12 million tons short of consumption rates, the report does not recommend specific tonnage increases.

However, both the Bean report, holding that employment levels are dependent upon steel production, and Dept. of Commerce statistics are cited to show that production should amount to 100 million tons annually by 1950 if high employment is to be maintained. Unemployment could reach 9 million by 1950, it was warned.

Steel required for the construction of new plants should be allocated, even at the expense of other requirements, the report goes on to say, holding that the end justifies the means. If the cost and financing are the major obstacles, it adds, "then the matter calls for government action in the national interest."

Construction Steel . .

New York

• • Estimated total bookings of fabricated structural steel for the month of April totaled 151,139 tons according to reports received by the American Institute of Steel Construction, Inc. This brings the total for the first 4 months to 655,-015 tons, an increase of 21 pct over the bookings for the first 4 months of 1947, and 49 pct greater than in the averaged 4 months of the 5 prewar years 1936-1940.

Shipments for the month are estimated at 149,341 tons, and for the 4 months 604,289 tons, an increase of 6 pct over the corresponding period last year.

The backlog, or tonnage available for fabrication, within the next 4 months only is 630,317 tons.

• • Fabricated steel awards this week included the following:

- 2400 Tons, Davis Dam, Nev., steel transmission line, towers, etc., for 230-kv transmission line, Davis Dam Preject, Bureau of Reclamation, Denver, Spec. 2115, to Bethlehem Pacific Coast Steel Corp., San Francisco.
 1600 Tons, Davis Dam, Nev., penstocks for Davis Power Plant, Bureau of Reclamation, Denver, Spec. 2104, to Southwest.
- Tons, Davis Dam, Nev., penstocks for Davis Power Plant, Bureau of Reclamation, Denver, Spec. 2104, to Southwest Welding & Mfg. Co., Alhambra, Calif.
 Tons, Grand Coulee, Wash., steel for bus structure for 230-kv right switch-yard and Grand Coulee power plant, Columbia Basin Project, Bureau of Reclamation, Denver, Spec. 2196, to Bethlehem Steel Co., Bethlehem, Pa.
 Tons, Providence, store for W. T. Grant Co. through Morton G. Tuttle Co., Boston, to American Bridge Co., Pittsburgh.
 Tons, Cleveland, generating plant for Cleveland Electric Illuminating Co., to American Bridge Co., Pittsburgh.
 tons, Williamspert, Pa., hospital, to Bethlehem Steel Co., Bethlehem.
 Tons, State College, Pa., Minerals Industry building for Pennsylvania State College, to Bethlehem Fabricators, Inc., Bethlehem.
 Tons, Carvani, Valley, Project, Calif.

- Bethlehem.

 160 Tons, Central Valley Project, Calif., steel for switchyard, Keswick Power Plant, Bureau of Reclamation, Denver, Spec. 2034, to Bethlehem Pacific Coast Steel Corp., San Francisco.

 115 Tons, New York, one-story garage building for Manhattan News Co. to Grand Iron Works, Inc., New York.

 110 Tons, Red Lion, Pa., Red Lion Cabinet Co., building, to Bethlehem Steel Co., Bethlehem.

 100 Tons, Ridgewood, N. Y., two-story building for the Home Federal Savings & Loan Institution, to Grand Iron Works, Inc., New York.

• • Fabricated steel inquiries this week included the following:

- 11,030 Tons, States of Arizona and Nevada, transmission towers for U.S. Bureau of Reclamation.
- 5000 Tons, Detroit, power station for Detroit
- 5000 Tons, Detroit, power station for Detroit Edison Co.
 4500 Tons, Cleveland, Ohio Public Service Co.
 2215 Tons, Wenatchee, Wash., cantilever bridge on P.S.H. No. 2, Columbia River bridge, Director of Highways, Olympia, bids to June 18.
 2000 Tons, Des Moines, office building for State of Iowa.
 560 Tons, Milwaukee, stores building for the Wisconsin Electric Power Co.
 375 Tons, Napa, Calif., bridges across Napa River and Cayetano Creek, Board of Supervisors, Napa, bids to June 8.

- pervisors, Napa, bids to June 8.
 300 Tons, Chicago, Chicago Transit Authority bus terminal.

- 290 Tons, Lancaster County, Pa., bridge on Route 36007—Section 1, Pennsylvania Dept. of Highways, June 4.
 280 Tons, Chippewa County, Wis., bridge section T0284, State of Wisconsin.
 260 Tons, Wisconsin, ore dock repair, Great Northern Ry. Co.
 180 Tons, Hollis and Buxton, Me., Salmon Falls Bridge over Saco River.
 160 Tons, Algoma, Wis., building.
 140 Tons, Outagamie County, Wis., bridge section S0384, State of Wisconsin.
 135 Tons, Appleton, Wis., building for Sears Roebuck Co.
 160 Tons, Presque Isle, Me., Gouldville bridge over Presque Isle stream.

Reinforcing bar awards this week included the following:

- 1000 Tons, Brighton, Mass., Hathaway Bakerries through Edmund J. Rappoli to Truscon Steel Co., Cleveland.
 500 Tons, South Bend, Ind., Sears Roebuck store building to Truscon Steel Co., Cleveland.
- land.

) Tons, Chicago, Nathan Goldblatt Memorial Hospital, University of Chicago, previously reported awarded to J. W. Snyder Construction Co. Ceco Steel Products has been awarded the steel contract.

) Tons, St. Paul, Farmers Mutual Bank Bidg. through Steenberg Construction Co., to Cowin Co.

) Tons, Iowa City, Iowa, library building for the University of Iowa, all bids rejected. 340
- for the

Reinforcing bar inquiries this week included the following.

- 505 Tons, Wenatchee, Wash., cantilever bridge on P.S.H. No. 2, Columbia River bridge, Director of Highways, Olympia, bids to June 18.
 120 Tons, Riverside County, Calif., two bridges between San Diego county line and Temecula, California Div. of Highways. Los Angeles, bids to June 17. ways, Los Angeles, bids to June 17.

· · Railroad car awards this week included the following:

The Western Maryland Ry. Co. has placed an order with Bethlehem Steel Co., Bethlehem, for 1000 55-ton hopper cars.

Granite City Pig Iron Up

Granite City, Ill.

· · Missouri-Illinois Furnaces, Inc., announced a \$1.25 per ton pig iron price increase effective May 17th. The increase, company spokesmen said, was due to a combination of circumstances beyond its control.

Basic iron is now \$45.25; No. 2 foundry, \$45.75; and malleable, \$46.25. An increase on Mar. 25 had set basic iron at \$44, with the other grades in proportion. Reasons cited for the increase were: (1) Raw material cost increases since Mar. 25; and (2) the need for making extensive furnace repairs on a risk hasis.

Missouri-Illinois has submitted a \$3.255,000 bid to War Assets Administration for the furnace but the award, according to the company, is snarled in red tape. It is not sure of getting its repair expense back should its bid be rejected.

Form New Society of Gray Iron Founders In Midwestern Area

Cleveland

. . A local group of management executives has established a Cincinnati Group of Gray Iron Founders' Society which takes in foundries in southern Ohio and parts of Indiana. Kentucky and West Virginia. At the organizational meeting, held in Cincinnati, the following group of. ficers were elected: Chairman, Ray. mong J. Redmont, Buckeye Foundry Co., Cincinnati; vice-chairman. William Beiser, Reliance Foundry Co., Cincinnati and secretary-treasurer, Frank E. Hutchinson, Reliance Foundry Co.

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R. L. Collier, executive vice-president of the society, called attention to the fact that in March of this year the industry shipped 37 pct more cast components than in the peak month of the war periodproof that deliveries are keeping pace with demand in spite of raw material scarcities. He also stated that about half the gray iron foundries in the United States are now embraced in the 15 local manage. ment groups thus far organized, six more groups being slated for launching in the next 30 days.

Poor quality and size of foundry coke appears to be the number one problem of the industry at present.

Cleveland

 Buyers of gray iron castings need not be apprenhensive about the ability of the foundries to make deliveries due to lack of raw materials, including pig iron and scrap. According to the Bureau of the Census, Dept. of Commerce, in March the gray iron industry shipped 1,169,085 net tons of cast components, a new all-time high record for shipments in any one month.

The March record showed an increase of 14 pct over February. These shipments were 9 pct above the same month last year, and represent shipments at an annual rate of over 14 million tons, about double the best prewar year.

Shipments of gray iron castings for the first quarter totaled 3,257,870 net tons, up 6 pct over the first quarter of last year. Unfilled orders for commercial jobbing castings at the end of March 1948 amounted to 2.726,415 net tons, representing a backlog of a little over 2 months' production.

Weekly Gallup Polls . . .

U. S. and German Views Differ on Function of Government

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• • • A profound difference of viewpoint toward the purpose and function of government is found among the American people and the German people, according to George Gallup, director, American Institute of Public Opinion.

A survey of public opinion in the American-occupied zone of Germany found Germans saying that if they had to choose they would take a government which provides security and jobs rather than a government which protects personal liberty.

Here in the United States a survey on the same issue finds just the opposite reaction. The overwhelming majority of Americans say that protection of freedom of elections, freedom of speech, religion, etc., is a more important function of government than providing the people with economic security.

The reaction in Germany is undoubtedly due in part to the grave economic condition of the country following the war. People who lack food and money are apt to place more emphasis on security than on freedom. However, the German reaction is probably also due in part to a different basic attitude toward freedom and democracy than that which prevails in the United States.

The issue posed here raises fundamental questions about the whole role of government. Some people say that freedom is meaningless when a man is starving or can't get a job. Radical elements often chastise democracy on the grounds that for the poor and unfortunate democracy often means merely "freedom to starve."

On the other hand, defenders of democracy point out that being well-fed and secure is a hollow mockery if a man can't do and think and say what he pleases; that a full stomach is no compensation for slavery.

• • • President Truman's request for renewal of the Trade Agreements Act is overwhelmingly approved by voters informed about the purpose of reciprocal trade treaties. People who know about the treaties vote better than eight to one to retain them.

But it may come as a shock to educators and national leaders to realize that, after 14 years of debate over Cordell Hull's trade treaty program, the vast majority of voters—two out of three—do not know what "reciprocal trade treaties" are.

Of the representative voters surveyed 34 pct said they know what reciprocal trade treaties are. While relatively few could give exact definitions, most grasped the general idea that such pacts give signatory countries mutual trade concessions. Under the Trade Agrements Act, Congress granted the President power to work out agreements with other countries to adjust tariff rates on individual items on a reciprocal give-and-take basis.

To those knowing about the treaties field reporters for the institute put this question:

"Some people say that because the U. S. is planning to spend \$6 Informed Voters Favor Trade Agreements Act Renewal; Many Are Unfamiliar With Program

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billion in the next year on the Marshall Plan it is no longer necessary to continue reciprocal trade agreements. Other people say that the Marshall Plan makes the need for trade agreements more necessary than ever. Do you think the trade agreements should or should not be continued?"

The answers:

					Pct	
Should be continued					.80	
Should not be continued	1.		,		. 8	
No opinion					12	

No major differences between Republican and Democratic voters arise in regard to continuation of the treaties. Eight out of ten in each party supports the treaties, and the same proportion exists among voters who call themselves independent of any party allegiance.

Coming Events

- May 31-June 2 National Assn. of Purchasing Agents, convention, New York.
- May 31-June 5 American Society of Mechanical Engineers, semiannual meeting, Milwaukee.
- June 6-9 American Gear Manufacturers Assn., annual meeting, Hot Springs, Va.
- June 6-11 Society of Automotive Engineers, summer meeting, French Lick, Ind.
- June 7-9 American Coke and Coal Chemicals Institute, annual meeting, White Sulphur Springs, W. Va.
- June 10-12 National Steam Specialty Club, annual meeting, Hot Springs, Va.
- June 16-18 Electric Metal Makers Guild, annual meeting, Bethlehem.
- June 21-25 American Society for Testing Materials, annual meeting,
- June 28-July 1 American Electroplaters' Society, Convention and Industrial Finishing Exposition. Atlantic City.
- June 30-July 2 Machinery Dealers National Assn., convention, French Lick Springs, Ind.
- July 16-24 American Road Builders' Assn., convention and Road Show, Soldier Field, Chicago.

Third and Fourth Quarters Look Like Bull Market for Tools

· · Outlook for the machine tool industry for the third and fourth quarters began to take on some of the long range aspects of a bull market this week as the possible machine tool requirements of the various armed services under the rearmament program took tentative shape.

While there's many a slip between the cup and the lip, as the saying goes, and a lot of big talk, the machine tool industry definitely appears to be due for a shot in the arm sometime during the third quarter, which will carry it forward at a high rate of production for many months to come.

Most significant development is the possible requirements of the AAF, some 265,000 machine tools, which was laid before representatives of the industry about 2 weeks ago. Early dope has it that the AAF is not going to need anywhere near this number of machines, but the requirements will still be sufficiently large to put the industry back on a big time basis.

These machines will be purchased by the contractors, prime and sub, but will be owned by the AAF. The AAF, however, will buy some equipment for its bases, it is understood.

Another development of some significance stems from the tentative requirements of the Ordnance Dept. calling for 100,000 machine tools. At a recent meeting in Cincinnati with representatives of local companies, a plan was proposed for pool orders to be released on M-Day (presumably the day many of the citizenry take to the hills or the subways). It is understood there is nothing certain about this program right now, except that it is within the pale of consideration.

Third development is the ERP setup, which will probably not make itself felt to the industry in the form of new firm orders until the fourth quarter. There's a lot of foreign business to be placed under this arrangement, but the official machinery in Washington has not begun to function as yet.

Needs For Armed Services Defense Program Take Tentative Shape

While ERP orders for machine tools to the tune of \$122 million are an assumed certainty in many segments of the trade, there has been nothing set up specifically on machine tools, it is understood. Probable outcome will be that these orders will be placed about the time the rearmament business gets under way and delivery will become an immediate problem.

Reed-Prentice Earnings

Worcester, Mass.

· · Net earnings of Reed-Prentice Corp. for the first quarter of 1948 amounted to \$170,170, compared to \$164,-151 for the corresponding pe-

riod of 1947.

First quarter 1948 sales amounted to \$1,068,936.55. Sales for the first quarter of 1947 were \$1,444,676.47, according to F. W. McIntyre, president.

If these requirements are cut in half, the outlook for the machine tool industry will still be extremely rosy, and in fact, require a 100 pct increase in production.

In the meantime, reports from trade sources indicate that business is going along at reasonable pace and if it continues at present levels, the industry will reach the \$300 million mark again this year, without any rearmament or ERP orders. This will be somewhat under last year's business on a unit basis, because of the price increases which were announced toward the end of the year.

In Detroit, activity in the machine tool industry is reported to be moderate; no new tooling programs have been announced recently, although orders for modernization and replacement equipment continue in good volume. according to most segments of the industry. There has been some revived interest in tool and die work. although the current volume is reported to be considerably below the first quarter, which turned out to be one of the best in the industry's history.

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Some proposals are being received from General Motors with interest at the moment centering around a possible tooling program for a new automatic transmission for Chevrolet. Some additional equipment for building the new Buick dynaflow transmission is also being considered, it is reported.

Some Detroit suppliers have recently received hold-ups on the proposed Reo truck engine program, but it is believed that the present obstacles will shortly be removed. Ordering by small shops continues in good volume, with orders being placed for deliveries of some items as late as 1950.

There is as yet no indication of a tooling program for the new Ferguson tractor plant which is under construction in Detroit.

Boston reports a pickup in business. It is not brisk, but sufficiently better to lend encouragement. There is almost always a market for lathes and they are, perhaps, selling more frequently than other types of tools right now.

Planers, shapers and various types of grinding machines are being booked. Millers have not figured much since the pre-January price advance drove buyers to cover.

Some metalworking plants are inclined to postpone tool purchases until the United States-Russian atmosphere is more defined. Its clearing one way or the other will, the trade believes, result in a freer market for tools.

Variety of Trends Seen in Market

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• • • A variety of trends were evident in the overall market picture this week. Pittsburgh and Chicago district consumers were apparently in good shape as far as stockpiles went, for a noticeable increase in rejections on openhearth grades was observed in Pittsburgh and shipments were easy in Chicago. On the other hand, Philadelphia and Cleveland showed comparative firmness.

In Philadelphia the market strength of the past few weeks continued with one consumer still taking genuine No. 1 steelmaking material at a premium price. Some high quality scrap moving from north Jersey and New York to this taker jacked the New York price up to \$36.50 to \$37.50, creating a spread in the Nos. 1 and 2 grades.

Mills have ducked absorption of the increased freight rate in the Buffalo district at least temporarily, as orders for No. 2 steel and bundles estimated at 15,000 tons were contracted last week at a delivered price of \$39.75, the old formula.

Cast prices in Chicago were off \$2 in the No. 1 grade of both machinery and agricultural cast. For good cast, however, the market was still very firm, as some foundries which were down for lack of coke and pig iron got back into action.

The strikes in the automotive plants are beginning to slow the Detroit market.

Dealers in several of the markets reported a drop in volume in receipts. But in those markets the trend had not yet affected shipments.

PITTSBURGH—The past week saw a noticeable increase in rejections of openhearth scrap. However, steel mills still have a practical attitude on rejections and cars are being turned back only where quality is definitely below present day standards—which are admittedly lower than melters would like. At least one mill is reported in excellent shape for electric furnace grades, is disinterested in this material at present prices and has even succeeded in shading them. Other buyers of these grades haven't followed and these quotations remain un-

changed for the week. Cast weakness is talked but prices are firm, except malleable, off \$1.

CHICAGO—Shipments to mills have been heavy for the past two or three weeks. Last week started off even better. Mills are not too interested in out of district scrap and are even refusing to take material at remote formula prices on which the freight is too high. Some f undries which were down because of coke and pig iron shortages are starting again. For good grades of cast the market is still very firm. No important railroad lists closed last week.

PHILADELPHIA—The market here is very strong but a 50¢ downward revision is necessary in No. 2 heavy melting steel. Brokers are buying this grade at \$38.50 and \$39.00. Other prices are unchanged. Although shipments continue at a high rate, dealers say that the scrap coming into their yards has dropped in volume, which can be expected to react adversely on the volume of future shipments.

CLEVELAND—Openhearth grades are in strong demand and there are signs of a weakening supply. Some of the brokers are claiming they can no longer cover at the formula and are giving their 50¢ commission and 50¢ more. Mills have been getting consumption, but shipments are falling off along with the quality of the material. Mills are in position to reject some of these cars, because they have a lot of scrap but they are also using a lot of scrap. Cast is a little weaker. There is a lot of material on track at some consuming points which leads some observers to believe that higher priced orders are around.

DETROIT—With the Chrysler strike continuing and a stoppage threatened against General Motors considerable uncertainty overhangs the Detroit scrap market. On the other hand, foundries are reported to be unwilling to make large commitments in the face of possible widespread automobile strikes and the market for cast has softened to reflect this possibility. Pricewise, however, the market remains unchanged and buying continues at formula levels.

BUFFALO—Any idea that Buffalo mills would absorb the increased freight rate on scrap was dissipated last week when dealers contracted to deliver an estimated 15,000 tons of No. 2 steel and hydraulic bundles at the old formula of \$39.75. The orders also broke up a budding stalemate over prices. The formula was further strengthened by cleaning up of the \$42 business in No. 2 steel. A Pittsburgh interest continued to offer \$2.50 over ceiling to the east of Buffalo for steelmaking grades, but a high rejection rate has resulted in an increased local supply from that direction. The mills also bought

machine shop turnings at the \$34.75 price, but refused to pay the premium for shovelings. Low phos scrap was active, with a nearby electric furnace purchasing over 2000 tons of plate at \$44.75.

NEW YORK—On the basis of movements of No. 1 heavy melting scrap to Philadelphia where a single consumer requires genuine No. 1 material and is paying a premium to get it, the price for that material in this district has followed and is up to \$36.50 to \$37.50. The market in general has been spotty and somewhat dull over the week.

CINCINNATI—There has been little change in the scrap market here. Openhearth material continues to move at formula prices and shipments generally are holding up pretty well. Foundry grades are no stronger, and foundries appear to be pretty well taken care of at the moment. Brokers are having no trouble covering on their orders despite reports that scrap is moving from this sector to the east at high prices.

BIRMINGHAM—A price raise of \$3 per ton by two of this district's principal merchant iron producers has brought no price increase for cast scrap. Dealers for a few days were reluctant to accept any large commitments in the apparent belief that a higher price might be obtained. Large consumers of cast refused to pay more, however, and considerable tonnages are moving again at prices quoted before the pig iron advance.

ST. LOUIS—Movement of scrap to the St. Louis district slowed up some during the week and it was estimated to be below consumption, as ingot operations were stepped up six points. Steel car axles were up \$1 on demand from rerollers.

BOSTON—The first noticeable break in many weeks in the cast market sent prices down from \$1 to \$3 and broke a calm that has existed for almost 3 months. Dealers reported that the demand for cast has fallen off markedly with the foundries not seeking large inventories at present prices. Prices in other grades showed no change with a fair amount of buying at formula prices.

TORONTO—The Canadian scrap situation showed little change for the week. Adverse weather and snow in Western Canada and Northern Ontario and Quebec has delayed the movement of scrap from these points to consuming centers in eastern Canada. However, it is expected there will be quite heavy movement of scrap from various outside points later this month. The situation as a whole is none too bright and dealers and consumers have no hope of domestic production meeting all Canadian requirements for s veral years to come. Big consumers in this country are arranging for large tonnages to be imported during the summer months, although it is not expected that much will reach this country from the States.

PITTSBURGH

	* *			
Per gros	s ton	delivered	to	consumer:

Let Lines toll delivered to	COHRAME	
No. 1 hvy. melting\$	40.00 to	\$40.50
RR. hvy. melting	41.90 to	41.50
No. 2 hvy. melting	40.00 to	40.50
RR. scrap rails	55.50 to	56.50
Rails 2 ft and under	62.50 to	63.50
No. 1 comp'd bundles	40.00 to	40.50
Hand bdld. new shts	40.00 to	40.50
Hvy. axle turn	41.50 to	42.00
Hvy. steel forge turn	41.50 to	42.00
Mach. shop turn	35.50 to	36.00
Shoveling turn	38.00 to	38.50
Mixed bor. and turn	35.50 to	36.00
Cast iron boring	38.00 to	38.50
No. 1 cupola cast	63.00 to	65.00
Hvy. breakable cast	52.50 to	\$3.50
Malleable	77.00 to	78.00
RR. knuck, and coup	54.75 to	55.75
RR. coil springs	54.50 to	55.50
RR. leaf springs		55.50
Rolled steel wheels		55.50
Low phos	47.50 to	48.00

CHICAGO

Per gross ton delivered to consumer:

Let Rinss roll mettation to	COHRAIME	E o
No. 1 hvy. melting	39.00 to	\$39.50
No. 2 hvy. melting	39.00 to	39.50
No. 1 bundles	39.00 to	39.50
No. 2 dealers' bundles	39.00 to	39.50
Bundled mach. shop turn.	37.00 to	37.50
Galv. bundles	35.00 to	35.50
Mach. shop turn	34.00 to	34.50
Short shov. turn	35.50 to	36.50
Cast iron borings	38.00 to	39.00
Mix. borings & turn	34.00 to	
Low phos. hvy, forge	48.00 to	
Low phos. plates	45.00 to	
No. 1 RR. hvy. melt	41.25 to	
Rerolling rails	53.00 to	
Miscellaneous rails	51.00 to	
Angles & splice bars	\$2.00 to	
Locomotive tires, cut	54.00 to	
Cut bolster & side frames.	49.00 to	
Standard stl. car axles	58.00 to	
No. 3 steel wheels	51.00 to	
Couplers & knuckles	54.00 to	
Rails, 2 ft and under	56.00 to	
Malleable	76.00 to	
No. 1 mach. cast	70.00 to	
No. 1 agricul. cast	60.00 to	
Heavy breakable cast	51.00 to	
RR. grate bars	60.00 to	
Cast iron brake shoes	58.00 to	
Cast iron carwheels	58.00 to	60.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting \$38.50 to \$39.50 No. 2 hvy. melting 38.50 to 39.50 No. 1 bundles 38.50 to 39.50 No. 2 bundles 38.50 to 39.50 Mach. shop turn 33.00 to 33.50 Shoveling turn 35.00 to 35.50 Cast iron borings 32.50 to 33.00 Mixed bor. & turn 32.50 to 33.00 Low phos., plate 46.00 to 48.00 No. 1 cupola cast 63.00 to 64.00 Hyy. breakable cast 53.00 to 54.00 Rails 18 in. & under 60.00 to 61.00 Rails random length 51.00 to 52.00 Drop broken 60.00 to 63.00	Ter Stone com deminates to companie	
No. 1 bundles 38.50 to 39.50 No. 2 bundles 38.50 to 39.50 Mach. shop turn. 33.00 to 33.50 Shoveling turn. 35.00 to 35.50 Cast iron borings 32.50 to 33.00 Mixed bor. & turn. 32.50 to 33.00 Low phos., plate 46.00 to 48.00 No. 1 cupola cast 63.00 to 64.00 Hvy. breakable cast. 53.00 to 54.00 Ralls 18 in. & under. 60.00 to 61.00 Ralls random length 51.00 to 52.00	No. 1 hvy. melting\$38.50 to \$	39.50
No. 2 bundles 38.50 to 39.50 Mach. shop turn. 33.00 to 33.50 Shoveling turn. 35.00 to 35.50 Cast iron borings 32.50 to 33.00 Mixed bor. & turn. 32.50 to 33.00 Low phos., plate 46.00 to 48.00 No. 1 cupola cast 63.00 to 64.00 Hvy. breakable cast 53.00 to 54.00 Rails 18 in. & under 60.00 to 61.00 Rails random length 51.00 to 52.00		
Mach. shop turn. 33.00 to 33.50 Shoveling turn. 35.00 to 35.50 Cast iron borings 32.50 to 33.00 Mixed bor. & turn. 32.50 to 33.00 Low phos., plate 46.00 to 48.00 No. 1 cupola cast 63.00 to 64.00 Hyy, breakable cast 53.00 to 54.00 Rails 18 in. & under 60.00 to 61.00 Rails random length 51.00 to 52.00		
Shoveling turn. 35.00 to 35.50 Cast iron borings 32.50 to 33.00 Mixed bor. & turn. 32.50 to 33.00 Low phos., plate 46.00 to 48.00 No. 1 cupola cast 63.00 to 64.00 Hvy. breakable cast. 53.00 to 54.00 Rails 18 in. & under. 60.00 to 61.00 Rails random length 51.00 to 52.00	No. 2 bundles 38.50 to	39.50
Cast iron borings 32.50 to 33.00 Mixed bor. & turn 32.50 to 33.00 Low phos., plate 46.00 to 64.00 No. 1 cupola cast 63.00 to 64.00 Hyy, breakable cast 53.00 to 54.00 Rails 18 in. & under 60.00 to 61.00 Rails random length 51.00 to 52.00	Mach. shop turn 33.00 to	33.50
Mixed bor. & turn. 32.50 to 33.00 Low phos., plate 46.00 to 48.00 No. 1 cupola cast 63.00 to 64.00 Hyy. breakable cast 53.00 to 54.00 Ralls 18 in. & under 60.00 to 61.00 Ralls random length 51.00 to 52.00	Shoveling turn 35.00 to	35.50
Low phos., plate 46.98 to 48.00 No. 1 cupola cast 53.00 to 64.00 Hyy. breakable cast 53.00 to 54.00 Rails 18 in & under 60.00 to 61.00 Rails random length 51.00 to 52.00	Cast iron borings 32.50 to	33.09
No. 1 cupola cast	Mixed bor. & turn 32.50 to	33.00
No. 1 cupola cast 63.00 to 64.00 Hyy, breakable cast 53.00 to 54.00 Rails 18 in. & under 60.00 to 61.00 Rails random length 51.00 to 52.00	Low phos., plate 46.00 to	48.00
Rails 18 in. & under 60.00 to 61.00 Rails random length 51.00 to 52.00		64.00
Rails random length 51.00 to 52.00	Hvy. breakable cast 53.00 to	54.00
	Rails 18 in. & under 60.00 to	61.00
	Rails random length 51.00 to	52.00
		68.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 hvy. melting	\$31.65	to	\$31.90
No. 2 hvy. melting	31.65	to	31.90
Nos. 1 and 2 bundles			
Busheling	31.65	to	31.90
Shoveling turn			28.90
Machine shop trun			26.90
Mixed bor & turn			26.90
Cl'n cast chem. bor	38.00	to	39.00
No. 1 machinery cast	55.00	to	57.00
No. 2 machinery cast	53.00	to	54.00
Heavy breakable cast	52.00	to	53.00
Stove plate			

DETROIT

Per gross ton, brokers' buying prices

I.O.D. CATE:	
No. 1 hvy. melting	\$35.50
No. 2 hvy. melting	35.50
No. 1 bundles	
New busheling	
Flashings	35.50
Mach. shop turn\$29.00 to	29.50
Shoveling turn 30.00 to	
Cast iron borings 30.00 to	30.50
Mixed bor. & turn 28.50 to	
Low phos. plate 39.50 to	40.50
No. 1 cupola cast 55.00 to	57.00
Heavy breakable cast 48.00 to	52.00
Stove plate 50.00 to	52.00
Automotive cast 55.00 to	57.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

Tel Rings ton dentered to companier	
No. 1 hvy. melting\$42.00 to	\$43.00
No. 2 hvy. melting 38.50 to	39.00
No. 1 bundles 42.00 to	43.00
No. 2 bundles 38.50 to	39.00
Mach. shop turn 34.50 to	35.00
Shoveling turn 34.50 to	35.00
Mixed bor. & turn 34.50 to	35.00
Clean cast chemical bor 42.00 to	44.00
No. 1 machinery cast 66.00 to	68.00
No. 1 mixed yard cast 62.00 to	63.06
Hvy. breakable cast 63.00 to	64.00
Clean auto cast 65.00 to	66.00
Hvy. axle forge turn 44.00 to	45.00
Low phos. plate 47.00 to	48.00
Low phos. punchings 47.00 to	48.00
Low phos. bundles 45.00 to	46.00
RR. steel wheels 52.00 to	53.00
RR. coil springs 52.00 to	53.00
RR. malleable 75.00 to	78.06
Cast iron carwheels 68.00 to	70.00
Cast Hon Cul whools word to	

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	37.50 to 38.50
Bundled sheets	37.50 to 38.50
Mach. shop turn	33.00 to 33.50
Locomotive tires, uncut	46.00 to 47.00
Mis. std. sec. rails	46.50 to 47.50
Steel angle bars	49.00 to 50.00
Rails 3 ft and under	52.00 to 53.00
RR. steel springs	48.50 to 49.50
Steel car axles	50.00 to 51.00
Grate bars	60.00 to 62.00
Brake shoes	58.00 to 60.00
Malleable	71.00 to 72.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast	65.00 to 67.00
Hvy. breakable cast	58.00 to 59.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 2 hvy, meiting 37.50 No. 2 bundles 37.50 No. 1 busheling 37.50 Long turnings \$25.00 to 26.00 Shoveling turnings 27.90 to 28.00 Cast iron borings 26.90 to 27.00 Bar crops and plate 42.50 to 43.50 Structural and plate 42.50 to 43.50 No. 1 cupola cast 64.00 to 67.90 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00	No. 1 hvy, melting	\$37.50
No. 2 bundles 37.50 No. 1 busheling 37.50 Long turnings \$25.00 to 26.00 Shoveling turnings 27.00 to 28.00 Cast iron borings 26.00 to 27.00 Bar crops and plate 42.50 to 43.50 Structural and plate 42.50 to 43.50 No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 53.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00	No. 2 hvy. melting	37.50
No. 1 busheling 37.50 Long turnings \$25.00 to 26.00 Shoveling turnings 27.00 to 28.00 Cast iron borings 26.00 to 27.00 Bar crops and plate 42.50 to 43.50 Structural and plate 42.50 to 53.00 No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap ralls 44.00 to 45.00 Angles & splice bars 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Ralls 3 ft & under 52.00 to 55.00	No. 2 bundles	
Long turnings \$25.00 to 26.00 Shoveling turnings 27.00 to 28.00 Cast iron borings 26.00 to 27.00 Bar crops and plate 42.50 to 43.50 Structural and plate 42.50 to 43.50 No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 53.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00	No. 1 busheling	37.50
Shoveling turnings 27.00 to 28.00	Long turnings\$25.00 to	26.00
Cast tron borings 26.00 to 27.00 Bar crops and plate 42.50 to 43.50 Structural and plate 42.50 to 43.50 No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00	Shoveling turnings 27.00 to	28.00
Bar crops and plate 42.50 to 43.50 Structural and plate 42.50 to 43.50 No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00	Cast iron borings 26.00 to	27.00
Structural and plate 42.50 to 43.50 No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		43.50
No. 1 cupola cast. 64.00 to 67.00 Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		43.50
Stove plate 55.00 to 58.00 No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		67.00
No. 1 RR. hvy, melt. 38.50 to 40.00 Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		58.00
Steel axles 38.00 to 39.00 Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		40.00
Scrap rails 44.00 to 45.00 Rerolling rails 51.00 to 53.00 Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		39.00
Rerolling rails		
Angles & splice bars 51.00 to 53.00 Rails 3 ft & under 52.00 to 55.00		
Rails 3 ft & under 52.00 to 55.00		
CARL IFOR CALWINGS 48.00 TO 50.00	Cast iron carwheels 48.00 to	

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1	hvy.	meltin	g					\$40.00	to	\$40.50
No. 2	hvy.	meltin	g					40.00	to	40.50
Mach.	shop	turn.	-					35.00	to	35.50
Short	shov.	turn.						37.00	to	37.50
Cast	iron b	orings						36.00	to	36.50
Low	phos.							45.00	to	45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting\$36.50	to	\$37.50
No. 2 hvy. melting		
No. 2 bundles		34.50
Mach. shop turn 29.00	to	29.50
Mixed bor. & turn 29.00		
Shoveling turn 31.00		
No. 1 cupola cast 55.00		
Clean auto cast 55.00		
Hvy. breakable cast 54.00		
Charging box cast 54.00		
Unstrp. motor blks 51.00		
Cl'n cast chem. bor \$4.50		

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy, melting	39.75 to	\$45.66
No. 2 hvy. melting		39.75
No. I bundles		39.74
No. 2 bundles		39.75
No. 1 busheling		39.75
Mach. shop turn	34.75 to	35.64
Shoveling turn	35.00 to	36.04
Cast iron borings		35.78
Mixed bor. & turn		34.75
Mixed cupola cast	62.00 to	64.04
Charging box cast	56.00 to	
Stove plate	62.00 to	
Clean auto cast	62.00 to	64.60
RR. malleable	70.00 to	75.60
Small indl. malleable	47.00 to	
Low phos. plate	44.75 to	
Scrap rails	50.00 to	
Rails 3 ft & under	57.00 to	
RR steel wheels	51.00 to	
Cast iron carwheels	51.00 to	
RR. coil & leaf spgs	51.00 to	
RR. knuckles & coup		
we evaporite		49.64

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting					\$39.50 to \$48.60
No. 2 hvy. melting					39.50 to 44.6
No. 1 bundles					39.50 to 40.00
No. 1 busheling					39.50 to 40.60
Drop forge flashings					39.50 to 48.60
Mach. shop turn					34.50 to 35.60
Shoveling turn					35.50 to 36.80
Steel axle turn					39.50 to 40.6
Cast iron borings					35.50 to 36.8
Mixed bor. & turn.		0			35.50 to 36.6
Low phos					. 44.50 to 45.0
No. 1 machinery car	81	١.			65.00 to 70.8
Malleable					75.00 to 77.6
RR. cast					
Railroad grate bars					60.00 to 62.0
Stove plate					
RR. hvy. melting					40.00 to 40.5
Rails 3 ft & under.					60.00 to 61.6
Rails 18 in. & under					61.00 to 62.0

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

			melting					9		\$25.00
			melting						*	
NO.	Z	bales	*******		•					36.44

K-6	r Rings	ron	44	FAA	10	44	58	COMME	THE R	DE B
No. 3	bales									
Mach.	shop	turn								16.9
Elec.	furn.	ft:	un	de	r			\$32.00	to	34.5
	cupola									
	VV. me									

LOS ANGELES

Per gross ton f.o.b. shipping point: No. 1 hvy. melting ... \$5.00 No. 2 hvy. melting ... \$5.00 No. 2 hvy. melting ... \$5.00 No. 2 bales ... \$5.00 No. 3 bales ... \$5.00 No. 3 bales ... \$1.00 No. 1 turn ... \$1.00 No.

SEATTLE

Per gross ton delivered to cons

	& No.					\$26.04
	furn. 1					30.04
No. 1	cupola	cast.		 	 	40.H
RR. h	vy. me	lung	 	 	 	28.00

HAMILTON, ONT.

Per gross ton delivered to consumers

	Cune																						
Heav	y m	elt	ing																			.1	121
NO 3	Dill	าสเ	es.																				- 31
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ROHE	PAT	വ	1704																			_	- 21
Bush	eling					-																0	-
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0 to \$40.00 0 to 40.00 1 to 30.00 0 to 30.00 1 to 40.00 1 to 30.00 1 to 30.00 1 to 40.00 1 to 70.00 1 to 70.00 1 to 70.00 1 to 70.00 1 to 40.00 1 to

\$25.66 25.66 25.66

.. 319.50 .. 16.60 0 to 34.00 0 to 43.00 .. 26.66

326.00 26.50 26.50 26.00 19.00 17.50 0 to 43.00

\$26.06 30.06 48.46 38.46





Natural Gas Will Be Power Source at Alcoa's New Texas Plant

New York

• • • In 2 years the Aluminum Co. of America expects to be able to produce an additional 70 million lb of ingots a year at a new reduction plant to be established at Point Comfort, near Port Lavaca on the Texas Gulf Coast between Corpus Christie and Galveston. But this added capacity will do little to improve the company's capacity as it will lose capacity of 40 million lb next March when the antiquated Niagara Falls potline is to be closed down.

Natural gas is to be used as the source of power for the new plant. Eighty thousand kilowatts will be developed from a battery of 80 Nordberg diesel engines. While this is the first peacetime use of power for Alcoa reduction plant developed from ohter than hydroelectric sources, Reynolds Metals Co. has been using gas power for diesel engine operation at its Jones Mills, Ark. plant. At the most favorable rates possible for natural gas, this development represents a cost increase factor in the production of aluminum.

Other cost factors involved in the establishment of the new plant at this location are very favorable. Freight rates on the shipment of raw materials are expected to be low. Alumina plants are operated by the company at Mobile, Ala. on the Gulf, from which barge shipments are possible; and at East St. Louis, Ill., on the Mississippi. Access to mills, especially to the new sheet mill at Davenport, Iowa, and to coastal market areas by water is improved by the strategic location of the plant.

The decision of Alcoa to turn to gas power for its latest plant is a turning point in the aluminum inTexas Coast Plant Capacity,
Rated At 70 Million lb,
Offsets Other Loss

0 0 0

dustry. Low cost hydroelectric power in tremendous quantities has been the keystone in the industry's production and cost structure. But the other aluminum producers are pinning their hopes for expanded capacity on additional water power developments. However, they say the day of privately financed large-scale hydroelectric plant has passed with the entry of government into power and reclamation projects.

The requirements of aluminum for the 70 group airforce have been played down in some quarters as inconsequential when compared with the nation's current aluminum production of about 1½ billion lb. However, the rearmament program contemplates the use of light metal equipment on a large scale for an airborne army. The fact remains that the present power resources of the nation are inadequate to support any major growth in aluminum production.

The power problem of aluminum producers is tied to a national power shortage in the United States and in Canada. The growth of industry in the Northwest has made demands upon the present power resources of the Bonneville Power Administration which prevents full operation of existent aluminum reduction plants in the West. Northwestern power has been diverted to other industries that are larger employers of manpower per unit of power consumed.

The St. Lawrence Seaway project, defeated on a treaty basis in the present session of Congress

largely because of the opposition to it as a deep water traffic artery to the Midwest by eastern port authorities and Midwest mining interests, may yet be realized as a power project under the stress of emergency needs by the U. S. and Canada. Pressure is already being applied for action by executive order which would not require the approval of Congress.

Dow Lowers Extensions

Midland, Mich.

or The Dow Chemical Co. has put into effect a new pricing method on magnesium extruded solid shapes and rectangles which is easier to calculate, and has reduced the prices of its other extruded products. The new method of pricing shapes is based on the weight per foot and takes into consideration the perimeter of the shape in inches. The former method priced by means of a form factor obtained by multiplying the perimeter in inches by 0.64 and dividing by the weight in pounds per foot.

Solid shapes and rectangles are estimated by the company to average 2 pct higher on Dowmetal M; 10 pct lower on FS; and FS-1, J-1 and O-1 are unchanged.

Round rods average 2 pct lower in M and FS; 4 pct lower in FS-1, J-1 and O-1. Tubing averages 15 pct lower in M; 13 pct lower in FS; 3 pct lower in FS-1; 9 pct higher in J-1.

Limit Nickel For 18-8

New York

• • • Stainless steel producers have been informed that the supply of nickel available to them in 1948 is to be limited by their 1947 consumption pattern. It is understood that a large part of the production of nickel is to be diverted to the nickel alloy steels required for the armament program, and for the strategic stockpile. Producers of low-carbon ferrochrome have found their sales volume to have stepped up appreciably in the last 2 months.

Nonferrous Metals Prices

	May 19	May 20	May 21	May 22	May 24	May 25
Copper, electro, Conn. Copper, Lake, Conn. Tin, Straits, New York Zinc, East St. Louis	21.625 94.00 12.00	21.50 21.625 94.00 12.00 17.30	21.50 21.625 94.00 12.00 17.30	21.50 21.625 94.00 12.00 17.30	21.50 21.625 94.00 12.00 17.30	21.50 21.625 94.00 12.00 17.30

y being cecutive ire the

S-1, J.1

ve found stepped months.

Primary Metals

,
(Cents per lb. unless otherwise noted)
Aluminum, 99+%, 10,000 lb, f.o.b
shipping point, freight allowed 15.00
Aluminum pig, f.o.b. shipping point 14.00
Antimony, American, Laredo, Tex 33.00
Antimony, American, Laredo, 1ex 33.00
Beryllium copper, 3.75-4.25% Be
dollars per lb contained Be\$20.50
Beryllium aluminum 5% Be, dollars
one the contained Be\$40.00
a amino del'd
Cobalt 97-99% (per ID)\$1.00 to \$1.72
Cappar electro Conn. Valley 21.50
denne loke Conn. Valley
Cald II S Treas. dollars per 02\$35.00
Indium. 99.8%, dollars per troy oz \$2.25
Iridium, dellars per troy oz \$105 to \$115
Lead. St. Louis
Lead, New York
Lead, New 10th
Magnesium, 99.8+%, f.o.b. Freeport,
Tex 20.50
Magnesium, sticks, carlots 34.50
Mercury, dollars per 76-lb flask, f.o.b. New York\$75 to \$77
f.o.b. New York
Nickel, electro, 1.0 b. New York 36.56
Palladium, dollars per troy oz \$24.00
Platinum, dollars per troy oz \$98 to \$101
Silver, New York, cents per oz 74.625
Tin. Grade A, New York 94.00
Zinc. East St. Louis 12.00
Zinc, New York
Zirconium copper, 6 pct Zr, per lb
contained Zr \$8.75
Contained &

Remelted Metals Brass Ingot

	(C	ents	1	þi	18		l	,		81	16		C	31	rl	0	6	d	3)
85-5-5-5																			
																			19.00-19.25
No. 1																			18.50-18.75
No. 1						8	×	*	*	8		*	×	*	×	*	*	*	18.00-18.25
80-10-10																			
No. 3											*	*				*			24.25
No. 3	15													×					21.75
88-10-2	ing	ot																	
No. 2	10										*	*							
No. 2	15																		28.00
No. 2	45																		22.25-22.75
Yellow																			
No. 4	05																		15.25-16.00
Mangar	1680	br	01	n2	se														
No. 4	21										*								18.00

Aluminum Ingot	
(Cents per lb, lots of 30,000 lb) 95-5 aluminum-silicon alloys	
0.30 copper, max	21.75 21.50
Piston alloys (No. 122 type) No. 12 alum, (No. 2 grade)	20.00 19.75 20.00
195 alloy 13 alloy AXS-679	19.75 21.50 20.00
Steel deoxidizing aluminum, notch- granulated or shot	bar
Grade 1—95 pet95½ pet 20.50 Grade 2—92 pet-95 pet 19.50	-20.00
	-19.50 -19.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point i	n
Copper, frt. allowed Cast, oval, 15 in. or longer Electrodeposited Rolled, oval, straight, delivered Brass, 80-20, frt. allowed	37% 32% 33.09
Cast, oval, 15 in. or longer Zinc, cast, 99.99 Nickel 99 pct plus, frt, allowed	33 % 20.50
Cast	51 52
Rolled, 1000 oz lots per troy oz	671/4
(Cents per lb, f.o.b. shipping point	()
copper cyanide, 100 lb drum	43 00
Copper sulfate, 99.5, crystals, bbls	11 50
Nickel salts, single, 425 lb bbls. frt.	11.00
allowed single, 420 10 DDIS. IFL.	44 80
allowed	14.50
sodium cyanide, 100 oz. lots, per oz.	54.00
odium cyanide, 96 pct domestic,	
100 lb drums	10.00
line cyanide, 100 lb drums	34.00
frt. allowed	7.75

Mill Products

Aluminum

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 24¢; 4S, 61S-O, 25.8¢; 52S, 27.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢, 0.081 in.; 2S, 3S, 25¢; 4S, 61S-O, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 34.3¢, 0.032 in.; 2S, 3S, 26.4¢; 4S, 61S-O, 30.1¢; 52S, 32.6¢; 24S-O, 24S-OAL, 34.2¢; 75S-OAL, 34.3¢, 43.1¢, Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 4S-F, 2.2¢; 52S, 24.2¢; 61S-O, 23.8¢; 24S-F, 24S-FAL, 24.2¢; 75S, 75S-AL, 30.5¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69¢; 23 to 25, 33.4¢ to 90¢; 35 to 37, 40.8¢ to \$1.25; 47 to 49, 58.7¢ to 31.84.

Extruded Round Rod, Square, Hex. Octagonal Bar: ¾ in. and over, 27¢ to 38¢; ½ to 34 in., 28¢ to 40.5¢; ¾ to ½ in., 29c to 43c; ¼ to ¾ in., 30¢ to 46.5¢; ¾ to ½ in., 25.6¢ to 63.5¢; 9/64 to ∯ in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 30¢ to 26.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 32¢ to 28¢.

Screw Machine Stock: Drawn, ½ to ¼ in., 11S-T3, 31¢ to 28.5¢; 10.4¢; cold-finished, ¾ to 1½ in., 11S-T3, 31¢ to 28.5¢; 24¢ to 34¢; cold-finished, % to 1½ in., 11S-T3, 31¢ to 28.5¢; 24¢ to 33 in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: colled, 0.051 to 0.374 in.; 2S, 33¢ to 24¢ 52S, 40.5c to 29¢; 56S, 42.5¢ to 34.5¢; 17S-T4, 46¢ to 31¢; 61S-T4, 41c to 30.5c; 75S-T6, 66¢ to 46¢.

Magnesium

Magnesium
(Cents per lb, f.o.b. mill, freight allowed.

Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ ln., 54¢-56¢;
0.188 in., 56¢-58¢; B & S gage 8, 58c-60e;
10, 59c-61e; 12, 63-65e; 14, 69c-74e; 16, 76c-81e;
18, 84c-89e 20, 96c-\$1.01; 22, \$1.22-\$1.31; 24, \$1:62-\$1.75. Specification grade higher.

Extruded Round Rod: M. diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M. size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M. in weight per ft, for perimeters of less than size indicated, 1.00 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 25 in., 43¢. Other alloys higher.

Extruded Round Tubing: M. wall thickness, outside diam, in., 0.049 to 0.057, ¼ to ½ \$1.14; % to ¾, \$1.02; ½ to ½, 76¢; 1 to 2 \$1., 55¢; 0.082; ¾ to ½, 54.5¢; ½ to ¾, 62¢; 1 to 2 in., 55¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

Nickel and Monel (Cents per lb, f.o.b. mill)

	Nickel	Mone
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod	FO	20
Hot-rolled		39
Cold-drawn		44 39
Angles, hot-rolled		41
Plates		71
Seamless tubes		31
Shot and blocks		31

Copper, Brass, Bronze (Cents per pound, freight prepaid on 200.1b)

E	xtruded		
	Shapes	Rods	Sheets
Copper	33.53		33.68
Copper, hot-rolled		30.03	
Copper, drawn		31.03	
Low brass	34.36*	31.39	31.70
Yellow brass	32.92*	29.85	30.16
Red brass	34.89*	31.92	32.23
Naval brass	30.28	29.03	34.97
Leaded brass	28.64	24.69	
Commercial			
bronze		32.96	33.27
Manganese bronze	33.87	32.37	38.47
Phosphor bronze,			
5 pet	53.95	52.95	52.70
Muntz metal	29.80	28.55	32.99
Everdur, Herculoy			
Olympic, etc	37.24	37.50	38.56
Nickel silver,			
10 pet		42.68	40.54
5 pet			38.98
Architectural	** **		
bronze	28.61	****	
*Seamless tubin	g.		

Scrap Metals

		Brass Mill Scrap	
(Cents	per	pound; add 1¢ per lb for of 15,000 lb or more.)	shipments
		of reference or morest	100

of aptoon to at moter)	Turn-
Heavy	
Copper 191/8	18%
Yellow brass 15%	14%
Red brass 171/4	16%
Commercial bronze 17%	1636
Manganese bronze 151/4	14%
Leaded brass rod ends 15%	
0 . 0 1. 1 0	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered producer.)	to
No. 1 copper, wire	
No. 2 copper, wire 17.5	25
Light copper 16.5	95
No. 1 composition 14.5	50
No. 1 comp. turnings 14.0	
Rolled brass 11.0	0.0
Brass pipe 11.	
Radiators 12.0	
Heavy yellow brass 10.3	
Aluminum	
Mixed old cast 11.0	90
Mixed old clips	
Mixed turnings 6.0	
Pots & pans 11.	75
Low copper 12.0	

Dealers' Scrap (Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass No. 1 heavy copper and wire. 1612-17 No. 2 heavy copper and wire. 1512-16

Light copper	
Auto radiators (unsweated)	934-1014
No. 1 composition	1216-13
No. 1 composition turnings	12 -121/4
Clean red car boxes	91/2- 93/4
Cocks and faucets	91/2-10
Mixed heavy yellow brass	8 - 814
Old rolled brass	91/2- 93/4
Brass pipe	10 -101/4
New soft brass clippings	1214-12%
Brass rod ends	10 -10%
No. 1 brass rod turnings	91/2-10
Aluminum	

Aluminum
Alum. pistons with struts 6 - 61/2
Aluminum crankcases 8%-9
2S aluminum clippings 10 -101/2
Old sheet & utensils 9 — 91/2
Dry borings and turnings 31/2-4
Misc. cast aluminum 8½— 9
Dural clips (24S) 8½— 9
71

Zinc		
	71/2-	
Old zinc	51/2-	
Zinc routings	8 -	
Old die cast scrap	4 -	41/4
Nickel and Monel		

11.656. 0110 11101101	
Pure nickel clippings	
Clean nickel turnings	
Nickel anodes	17 -18
Nickel rod ends	17 -18
New Monel clippings	
Clean Monel turnings	8 - 9
Old sheet Monel	10 -10%
Old Monel castings	74-8
Inconel clippings	9 10
Nickel silver clippings, mixed	8 - 8 -
Nickel silver turnings mixed	

	turnings.		
	Lead		
	d		15 -151 91/4 - 91
		A 11	

C	Magne			0 4
Segregated				8 - 9
Castings	*** ***			14- 54
	Misc	ellan	eous	

AND THE SAME RESERVED AND ASSESSED AND ASSESSED.	5 Ch
No. 1 pewter	60 -62
No. 1 auto babbitt	45 -47
Miexed common babbitt	
Solder joints	
Siphon tops	
Small foundry type	
Monotype	
Lino, and stereotype	
Electrotype	
New type shell cuttings	
Hand picked type shells	
Lino and stereo dross	
Tillactes decree	0 01

Comparison of Prices

in Italics. The various basing points for finished semifinished steel are listed in the detailed tables.

Steel prices on this page are tions of major basing points: Pi Youngstown.	the aver	age of var Chicago,	rious f.o. Gary, C	b. quota- leveland,
Flat-Rolled Steel: M	av 25. N	fav 18. A	pr. 27.	May 27.
(cents per pound)	1948	1948	1948	1947
Hot-rolled sheets	2.775	2.775	2.80	2.50
Cold-rolled sheets	3.495	3,495	3.55	3.20
Galvanized sheets (10 ga.)	3.913*	3.913*	3.95	3.55
Hot-rolled strip	2,775	2,775	2.80	2.50
Cold-rolled strip	2.53*	3.53*	3.55	3.20
Plates	2.93	2.93	2.95	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
	30.00	30.00	30.00	00.00
Tin and Terneplate:				
(dollars per base box)	00.50	00.70	0000	@F 0F
Tinplate (1.50 lb) cokes		\$6.70	\$6.80	\$5.75
Tinplate, electro (0.50)lb)		5.90	6.00	5.05
Special coated mfg. ternes	5.80	5.80	5.90	4.90
Bars and Shapes:				
(cents per pound)	0.000	0.055	0.00	0.00
Merchant bars	2.875	2.875	2.90	2.60
Cold-finished bars	3.483	3.483	3.55	3.20
Alloy bars	3.213	3.213	3.30	3.05
Structural shapes	2.767	2.767	2.80	2.50
Stainless bars (No. 302).	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire:				
(cents per pound)				
Bright wire	3.608*	3.608	3.55	3.30
Rails:				
(dollars per 100 lb)				
Heavy rails	\$2,725	\$2.725	\$2.75	\$2.50
Light rails	3.05	3.05	3.10	2.85
Semifinished Steel:				
(dollars per gross ton)		045 001	045 001	040.00
Rerolling billets			\$45.00†	
Slabs, rerolling		45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp:				
(cents per pound)		0.40	2.25	0 ==
Wire rods				2.55
Skelp*Revised	2.88*	2.88*	2.90	2.35
†Net ton *Revised				

Pig Iron: May 25,	May 18,	Apr 27	M 0
(per gross ton) 1948	1948	1948	1947
No. 2, foundry, Phila\$44.85	\$44.85	\$44.61	\$36.51
No. 2, Valley furnace 39.50	39.50	39.50	33.50
No. 2, Southern Cin'ti 45.47	45.47	43.28	34.75
No. 2, Birmingham 39.38	39.38*	37.38	29.88
No. 2, foundry, Chicagot. 39.00	39.00	39.00	33.00
Basic del'd Philadelphia. 44.35	44.35	44.11	36.9
Basic, Valley furnace 39.00	39.00	39.00	33.00
Malleable, Chicago† 39.50	39.50	39.50	33.50
Malleable, Valley 39.50	39.50	39.50	33.5
Charcoal, Chicago 65.55	62.55	62.46	45.9
Ferromanganeset145.00	145.00	145.00	135.0
† The switching charge for deliver cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised.	y to 10un	dries in	the Ch
cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised.	y to roun	dries in	the Chi
cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised. Scrap:	\$40.25	\$40.25	
cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised. Scrap: (per gross ton)			\$32,2
cago district is \$1 per ton. 1 For carlots at seaboard. Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mlt'g steel, Phila. 42.50 Heavy melt'g steel, Ch'go 39.25	\$ 40.25	\$40.25	\$32.2 29.7 29.2
cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy melt'g steel, Phila. 42.50 Heavy melt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50	\$40.25 42.50 39.25 35.50	\$40.25 41.50 39.25 35.50	\$32.2 29.7 29.2 27.0
cago district is \$1 per ton. 1 For carlots at seaboard. Revised. 8crap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mit'g steel, Phila. 42.50 Heavy melt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50 Low phos. Young'n 45.25	\$40.25 42.50 39.25 35.50 45.25	\$40.25 41.50 39.25 35.50 45.25	\$32.2 29.7 29.2 27.0 35.7
cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mlt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50 Low phos. Young'n 45.25 No. 1, cast, Pittsburgh 64.00	\$40.25 42.50 39.25 35.50 45.25 64.00	\$40.25 41.50 39.25 35.50 45.25 64.00	\$32.2 29.7 29.2 27.0 35.7 36.5
cago district is \$1 per ton. \$1 For carlots at seaboard. \$2 Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mlt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50 No. 1, cast, Pittsburgh	\$40.25 42.50 39.25 35.50 45.25 64.00 67.00	\$40.25 41.50 39.25 35.50 45.25 64.00 65.50	\$32.2 29.7 29.2 27.0 35.7 36.5 41.0
cago district is \$1 per ton. ‡ For carlots at seaboard. * Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mlt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50 Low phos. Young'n 45.25 No. 1, cast, Pittsburgh 64.00	\$40.25 42.50 39.25 35.50 45.25 64.00	\$40.25 41.50 39.25 35.50 45.25 64.00	\$32.2 29.7 29.2 27.0 35.7 36.5 41.0 37.2
cago district is \$1 per ton. 1 For carlots at seaboard. Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mit'g steel, Phila. 42.50 Heavy melt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50 Low phos. Young'n 45.25 No. 1, cast, Pittsburgh 64.00 No. 1, cast, Philadelphia. 67.00 No. 1, cast, Chicago 71.50	\$40.25 42.50 39.25 35.50 45.25 64.00 67.00	\$40.25 41.50 39.25 35.50 45.25 64.00 65.50	\$32.2 29.7 29.2 27.0 35.7 36.5 41.0
cago district is \$1 per ton. 1 For carlots at seaboard. Revised. Scrap: (per gross ton) Heavy melt'g steel, P'gh\$40.25 Heavy mlt'g steel, Phila. 42.50 Heavy melt'g steel, Ch'go 39.25 No. 1, hy, comp. sh't, Det. 35.50 Low phos. Young'n 45.25 No. 1, cast, Pittsburgh 64.00 No. 1, cast, Philadelphia. 67.00 No. 1, cast, Chicago 71.50 Coke, Connellsville:	\$40.25 42.50 39.25 35.50 45.25 64.00 67.00 73.50	\$40.25 41.50 39.25 35.50 45.25 64.00 65.50	\$32.2 29.7 29.2 27.0 35.7 36.5 41.0

Composite Prices

FINISHED STEEL (Base Price)

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled

Nonferrous Metals:

PIG IRON

(cents per pound to large buyers)

Copper, electro. Conn... 21.50 Copper, Lake Conn... 21.625 Tin, Grade A, New York 94.00 Zinc, East St. Louis... 12.00 Lead, St. Louis... 17.30

Aluminum, virgin 15.00 Nickel, electrolytic 36.56

Magnesium, ingot 20.50 Antimony, Laredo, Tex... 33.00

A A.	ATELTERALIES IN A MANAGEM (AND	AGE A MILE!			COMPANY
May 25,	1948 3.24454	¢ per lb	\$40.53 per	gross ton	\$40.66 per
One week	ago3.24454	¢* per lb	\$40.53 per	gross ton	\$40.66 per
One month	ago3.27585	¢ per lb	\$40.11 per	gross ton	\$40.33 per
One year	ago2.85664	¢ per lb	\$33.15 per	r gross ton	\$30.42 per
* Revise	d				
	HIGH	LOW	HIGH	LOW	HIGH
1948	3.27585¢ Feb. 17	3.22566¢ Jan. 1	\$40.53 May 18	\$39.58 Jan. 6	\$41.83 Jan. 29
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	\$23.61	\$23.61	19.17 Jan. 11
1943	2.29176€	2.29176¢	23.61	23.61	\$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17
1941	2.43078¢	2.43078¢	\$23.61 Mar. 20		\$22.00 Jan. 7
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18		19.61 July 6	
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30
1936	2.32263¢ Dec. 28	2.05200¢ Mar.10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5		
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5		8.50 Jan. 12
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	water man and wa	15.00 Feb. 18
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29
	Weighted index ba	ased on steel bars,	Based on aver	ages for hasic from	Rased on No.

1.97319¢ Dec. 9 2.26498¢ Oct. 29 18.71 May 14 18.21 Dec. 17 Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue. Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

\$19.17 Apr. 10 16.04 Apr. 5 14.08 May 16 11.00 June 7 30 3 22 30 21 12.67 June 12.67 June 10.33 Apr. 23 9.50 Sept. 25 12.25 Aug. 8 8.50 Jan. 12 11.33 Jan. 6 6.75 Jan. 1 6.43 July 5 8.50 Dec. 29 13.56 Dec. 6 14.79 Dec. 15 15.90 Dec. 16 15.00 Feb. 18 11.25 Dec. 17.58 Jan. 29 14.08 Dec.

23.00

21.625

80.00 10.50

14.80

15.00

37.67

21.625

94.00 12.00

17.30

15.00

36.56

20.50

per gross ton per gross ton.... per gross ton.... per gross ton....

> LOW \$39.75 Mar. 9 29.50 May 20

19.17 Jan. 1 18.92 May 2

15.76 Oct. 24 \$19.17 19.17

21.625

 $94.00 \\ 12.00$

17.30

15.00

36.56

20.50

33.00

SCRAP STEEL

Based on No. 1 heavy meitist steel scrap quotations to consumer at Pittsburgh, Philadelphia and Chi-cago.

Iron and Steel Prices . . .

ay 27, 1947

36.51 33.50 34.75 29.88 33.00 36.92

33.00 33.50 33.50 45.99 135.00 e Chi-

\$32,25 29.75 29,25

35.75 36.50 41.00 37.25

\$10.50 11.25

> 23.00 21.625 80.00 10.50 14.80 15.00 37.67 20.50 33.00

finished See ex-Index ails see the curents for ipments

on..... on..... on.....

Mar. 9 May 20 Jan. 1 May 22

Oct. 24 19.17 19.17

Apr. 10
Apr. 9
May 16
June 9
June 9
June 8
Apr. 29
Sept. 25
Jan. 3
July 5
Dec. 29
Dec. 29
Dec. 8

onsumen a and ChiSteel prices shown here are f.o.b. basing points in cents per pound unless otherwise indicated. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of deliverd prices at major ports. (1) Commercial quality sheet grade; primes, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Arbitrary delivered prices. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) from 0.035 to 0.075 in. thick by % to 3½ in. wide. (16) Deliverd Los Angeles; add 0.55¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. (18) 24 to 14 gage, up to 48 in.; 26 gage, up to 22 in.; 30 to 27 gage, up to 36 in.

		Price	s at basi	ng points	apply o	nly to th	ie sizes an	d grades	produces	at those	points.		DELIVERED TO		
PRODUCTS	Pitts- burgh	Chicago	Gary	Cleve-	Birm- Ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio		San Francisco, Los Angeles	Detroit 10	New York	Phila- delphil
INGOTS Carbon forging	\$46.00		Rerolli	ng ingots-	-\$36.00 p	er net tor	f.o.b. mill	(Spot ma	arket as \$	75 to \$90 p	er gross to	1)			
Alloy	\$56.00										Canton = \$56.00				
BILLETS, BLOOMS, SLABS Carbon, rerolling 17	\$45.00	\$45.00	\$45.00	\$47.00	\$45.00	\$45.00		\$45.00							
Carbon forging billets	\$54.00	\$54.00	\$54.00	\$54.00	\$54.00	\$54.00	(per ne	et ton)							
Alloy	\$66.00	\$66.00				(Beth	lehem, Ma	ssillon, C	anton =	\$66.00)					
PIPE SKELP	2.85 to 2.90						2.90								
WIRE RODS	2.80 to 3.55	2.80 to 3.80		2.80 to 3.05	2.85						Worcester = 2.90	3.524513			
SHEETS Hot-rolled 6	2.75 to 2.80	2.75 to 2.80	2.75	2.80	2.75 to 2.80	2.80	2.75 to 2.80	2.80			nd, Ky. 2.80	3.494 16 to 3.6875	2.96 to 3.01		
Cold-rolled 1	3.45 to 3.50	3.45 to 3.55	3.45	3.50		3.55	3.55	3.5518	3.65	3.50			3.66		
Galvanized (10 gage)	3.85	3.95	3.85 to 3.95		3.85 to 3.95		3.95	3.95	4.05	3.95	Ashland = 3.95	4.62416			-
Enameling (12 gage)	3.85	3.75	3.75 to 3.85	3.95			3.95		4.05	3.85			4.11 to 4.16		
Long ternes 2 (10 gage)	4.05		4.05											-	
STRIP Hot-rolled ²	2.80	2.75 to 2.80	2.75	2.75 to 2.80	2.75		2.75 to 2.80					3.554 16 to 3.9125	2.96 to 3.01		
Cold-rolled 4	3.45 to 3.50	3.55 to 3.65	3.55	3.45 to 3.50			3.55			Worceste	= 3.65) t	0	3.66		
TINPLATE Cokes, 1.50 lb, 8 base box	6.70	6.70	6.70		6.80			6.80	6.90		en, Ohio \$6,80)				
Electrolytic 0.25, 0.50, 0.75 lb, box		-		-	Deduct \$	1.00, 80¢ :	and 60¢ res	pectively	from 1.50		ase box pric	0.	-		
TERNES, MFG., special coated					Deduct 9	0¢ from 1.	50 lb coke	base box	price.						
BLACKPLATE, CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	-				Deduct \$	1.60, \$1.70	and \$1.60	respectiv	rely from	1.50 lb cok	e base box	price.			
BLACKPLATE, h.e., 29 ga. 11	4.65	4.65	4.65					4.75	4.85						
BARS Carbon Steel	2.85 to 2.90	2.85 to 2.90	2.85	2.90	2.85 to 2.90	2.90	2.85 to 2.90					3.579 16 to 3.629 16	3.06 to 3.11		
Reinforcing (billet) 7	2.70 to 2.80	2.70 to 2.80	2.70		2.70		2.70					3.32516			
Cold-finished ⁸	3.45 to 3.55	3.45 to 3.55		3.45									3.61 to 3.76		
Alloy, hot-rolled	3.20	3.20 to 3.30	3.20			3.30	3.20	Bethle	hem, Mas	sillen, Can	ton = 3.30				
Alloy, cold-drawn	4.00 to 4.10	-		4.00	-	4.10		Massil	lon, Canto	on = 4.10					
PLATE Carbon steel 12	2.90 to 2.95		2.90 to 2.95	2.95	2.85 to 2.90		2.11 to 2.95	Coate		45, Claym Utah = 2	ont = 3.65	3.837514			
Floor plates	4.05	3.95 to 4.05	3.95	4.05											
Alloy	3.70	3.70	3.70						Coates	ville = 4.80			1		
SHAPES, Structural	2.75	2.75 to 2.80	2.75 to 2.80		2.75		Bet	hlehem =	2.80, Ge	neva, Utah	= 2.75	3.424 16 to 3.49			
MANUFACTURERS' W!RE®	3.45 to 3.80			3.45	3.45 to 3.55					Worce	ster = 3.55 th = 3.50				
Spring (high carbon)	4.50	4.50		4.50	5,63				Tree	Norcester	= 4.60	5.534511			
PILING, Steel sheet	3.30	3.30	-	-	-	3.30	-		110	Ton, Duiu	-4.75		-	-	-

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

	Chromiu	ım Nickel	Straight Chromium				
Basing Point	No. 304	No. 302	No. 410	No. 430	No. 442	No. 448	
ngot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila Booms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt Babs, P'gh, Chi, Canton, Balt, Phila, Reading Blilets, P'gh, Chi, Canton, Watervilet, Syracuse, Balt, Beth	Subject to Subject to	negotiation negotiation negotiation negotiation		Subject to Subject to	negotiation negotiation negotiation negotiation		
Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50	
ars, h-r, P'gh, Chi, Canton, Dunkirk, Watervilet, Syracuse, Balt- Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge, ars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading,	27.50	26.00	20.50	21.00	24.50	30.00	
Ft. Wayne, Watervilet, Beth, Brackenridge, Balt, Coatesville. lates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville. hapes, structural, P'gh, Chi, Brackenridge, Balt, Coatesville. heets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge. trip, h-r, P'gh, Chi, Reading, Canton, Youngstown. trip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg. trip, c-r, P'gh, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft, Wayne,	31.50	26.00 29.50 26.00 37.00 23.50 30.50	20.50 23.50 20.50 29.00 18.50 24.00	21.00 24.00 21.00 31.50 19.00 24.50	24.50 28.00 24.50 35.50 28.00 35.00	30.00 33.00 30.00 39.50 38.00 56.50	
Brackenridge Brackenridge Jire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg. od, h-r, Syracuse ubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee.	27.05	26.00 30.30 25.97 72.09	20.50 23.80 20.02	21.00 24.34 20.56 68.49	24.50 34.82 24.34	30.00 56.26 28.75	

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)

W	Cr	V	Mo	Co		Base per lb
18	4	1	_	-	 	82¢
18	4	1	_	5	 	\$1.29
18	4	2	-	-	 	93¢
1.5	4	1.5	8	_	 	59¢
6	4	2	6	-	 	63¢
High-ca	rbon-	chron	nium*		 	47¢
Oil hard	dening	man	ganes	e*	 	26€
Special	carbo	on• .			 	24¢
Extra	carbon	·			 x ×	20€
Regular	carb	on.			 	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

									Per lb
Armature .				 	*		*		 4.70¢ to 5.05¢
Electrical				 					5.20¢ to 5.45¢
Motor		* ×		 	*	*			 5.95¢ to 6.30¢
Dynamo			*	 			*		 6.65¢ to 7.50¢
Transformer	72			 					 7.15¢ to 8.25¢
Transformer	65		*	 		*			 7.85¢ to 9.20¢
Transformer	58			 			*		 8.55¢ to 9.90¢
Transformer	52	*	*	 	×	*			 9.35¢ to 9.70¢

F.o.b. Chicago and Gary: armature through motor only. F.o.b. Granite City add to lower quotation 0.55¢ for armature through and including 72, and 0.45¢ for balance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, 100 lb and heavier,	
No. 1 O.H., per 100 lb\$2.70 to\$	2.75
Joint bars, 100 lb	3.7
Light rails (from billets) per 100 lb.	3.0
• CF&I charges \$3.05.	

Base per	rlb
Cut spikes 4.	35¢
Screw spikes 6.	90€
Tie plate, steel 3.	55¢
Tie plates, Pittsburg, Calif 3.	70¢
Track bolts 7.	00¢
Track bolts, heat treated, to rail-	254

C-R SPRING STEEL

Base per pound f.o.b. Pittsburgh, Cleveland

				-			-	 -									
0.08	to	0.40	car	bon								į.		*		×	3.45¢
0.41	to	0.60	car	bon			*		*			*	*				4.95¢
9.61	to	0.80	car	bon		×					×				×		5.550
0.81	to	1.05	car	bon		*		. ,	 *		×	ж.			*	×	7.05¢
1.06	to	1.35	car	bon													9.35€
Wor	ces	ter,	add	0.2	00												

CLAD STEEL

•	
pound	
Plate	Sheet
*24.00	*22.00
21.50	
* 20.00	
30.00	
24.00	****
	9.00
	*24.00 21.50 *30.00 24.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

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for and pip pri lar sm (lo and poi pil low we

To the dealer, f.o.b. Pittsburgh, Chicago, Birmingham

	Base	Column San Francisco
Standard & coated nails*	91	112
Galvanized nails*	91	112
Woven wire fencet	97	120
Fence posts, carloadstt	104	
Single loop bale ties	94	118
Galvanized barbed wire**	111	131
Twisted barbless wire	111	***

* Also Duluth; Worcester, 6 columns higher, † 15 ½ gage and heavier. ** On 80-rod spools, in carloads. †† Duluth only.

Base pe	
Annealed fence wire \$\$4.10	\$5.1145
Annealed, galv. fencing: 4.55	5.5645
Cut nails, carloadstt 6.15	

 \ddag Add 10¢ at Worcester. $\ddag\ddag$ Wheeling only, Pittsburgh add 15¢ (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-	Corten	Double Strength No. 1	Dyn- alloy	HI Steel	Mayari R	Otis- coloy	Yoloy	NAX High Tensile
Producer	Repub-	Carnegle- Illinois, Republic	Repub-	Alan Wood	Inland	Bethle- hem	Jones & Laughlin	Younga- town Sheet & Tube	Great Lakee Steel
Plates	4.55	4.45	4.58	4.55	4.45	4.55	4.45	4.55	4.55
Sheets Hot-rolled Cold-rolled Galvanized	4.30 5.30	4.20 5,20 5,90	4.30 5.30	4.80	4,20 5,20 5,90	4.30 5.30 6.00	4.20 5.20	4.30 5.30	4.30 5.30
Strip Hot-rolled Cold-rolled	4.30	4,20	4.30 5.30	***	4.20	4.30 5.30	4.20 5.30	4.30 5.30	4.30 5.30†
Shapes		4.20			4.20	4.30	4.20	4.30	
Beams		4,20			4,20	4.30			
Bare Hot-rolled	4.48	4,35	4.45		4,35	4.45	4.35	4.45	4.45
Bar shapes		4.35			4.35	4.45	4.35	4.45	

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only Base price, \$200.00 per net ton One producer allows 1 point less discount on steel buttweld.

Laleures & Late

Standard, threaded &	coup	led
iteel, buttweld	Black	Galv.
4-in	48	3014
Z-in	51	341/2
1-10.	531/2	371/2
14-in	54	38
14-in	541/4	381/2
2-in	55	39
21/2 and 3-in	551/2	391/2
Wrought Iron, buttweld		
4-in	+11	+35
4-in	+ 11/2	+25
f and 1%-in	4	+16%
14-in	9 1/2	+13
2-in	10	+121/2
Steel, lapweld		
1-in	44 1/4	28
1% and 3-in	48 1/4	32
31/2 to 6-in	50 1/2	34
Steel, seamless		
2-in	43 1/4	27
21/4 and 3-in	46 1/2	30
81/2 to 6-in	48 1/2	32
Wrought Iron, lapweld		
1-in	11/4	+20
11/2 to 31/2-in	4	+16
4-in	8	+101/4
4½ to 8-in	6	+12
Extra Strong, plain e	nds	
21 1 1 11 11		

Steel buttweld

loago,

umn Ian noisee

112 120

118 131

olumna

On 80h only.

San ancisco \$5.1145 5.5645

heeling to job-

 Steel, buttweld
 46

 ½-in.
 50

 i-in.
 52

 ½-in.
 52

 ½-in.
 52

 ½-in.
 53

 ½-in.
 53

 ½-in.
 53

 ½-in.
 64

 Wrought Iron, buttweld
 ½-in.

 ½-in.
 4

 ½-in.
 10

 Steel, lapweld
 2-in.

 43
 4

 3-in.
 43

 3-in.
 43
 34 37 37 37 38 38 38 38 2½ and 3-in. 43½
½ to 6-in. 52
Steel, seamless

BOILER TUBES

Seamless steel and electric welded com-mercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length & to 24 ft, inclusive.

020		Sear	nless	Electr	c Weld
OD	Gage	Hot-	Cold-	Hot-	Cold-
in in.	BMG	Rolled	Drawn	Rolled	Drawn
2	13	\$17.84	\$20.99	\$17.30	\$20.36
21/2	12	23.99	28.21	23.27	27.36
9	12	26.68	31.40	25.88	30.46
31/2	11	33.35	39.26	32.35	38.08
4	10	41.40	48.70	40.16	47.24

CAST IRON WATER PIPE

ı	Per wet tan
ŧ	6-in to 24-in., del'd Chicago
ı	6-in. to 24-in., del'd New York 95.50
ı	6-in and larger folks and larger folks and larger folks are series and larger folks are series and larger folks are series for the series for th
B	6-in and larger, f.o.b. cars, San Francisco Los
	Francisco, Los Angeles, for all
	shipment loss, rall and water
	Class 'A" and gas pipe, \$5 extra; 4-in.
	pipe is \$5 a ton above 6-in.
	ton above 0-In.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b Pittsburgh, Cleve-land, Birmingham or Chicago)

Rase discount less case lots

Machine and Carriage Bolts

	Percent	Off	List
1/4 in. & smaller x 6 in.	& short	er .	. 45
9/16 & % in. x 6 in. & s	horter		46
14 in. & larger x 6 in. &	shorter.		. 43
All diam, longer than 6	In		. 41
Lag, all diam over 6 in.	long		. 44
Lag, all diam x 6 in. &	shorter.		. 46
Plow bolts	******		54
Note Cald Donahad as	Dat D		The state of

Nuts, Cold Punched or Hot Press

	(Hexag													
1/2 in. and	d smalle	r .											. 4	43
9/16 to 1	in. inc	iusi	VO		× 6								. 1	87
1% to 1	1/2 in.	inel	usi	Ve		*		*					4	F(
1 % in. a	nd large	r .							*			*		5;
	ove bol													
for full an addit	contain	er	qui	an	tit	ie	8.		8	r	16	T	0	t

Semifin. Hexagon Nuts	USS	SAE
7/16 in, and smaller		46
1/2 in. and smaller	44	
1/2 in. through 1 in		44
9/16 in. through 1 in		42
1% in. through 1% in		42
1% in. and larger		
In full case lots, 15 pct		
count For 200 lb or mo	re fre	oht al

count. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh. Stove Bolts

Packages, nu	its sep	arate .	65	and 10
In bulk				75
On stove	bolts 1	freight	allowed	up to
65¢ per 100	lb bas	sed on	Clevela	nd. Chi-
cago, New Y				

Large	Rivets			and		rger)
F.o.b.	Pittsburgh,	Cleve	and	. Ch	11-	
	, Birminghan	a				\$5.65

Small Rivets	(7/16 in. and smaller) Percent Off List
F.o.b. Pittsburgh, Birmingham	Cleveland, Chicago, 55

Cap and Set Screws (In packages)	Percent	Off	List
Hexagon head cap screw fine thread, up to and	s. coars	e or	
6 in., SAE 1020, bright % to 1 in. x 6 in., SAE	t t		53

o m., SAL IVAU, Dright	03
% to 1 in. x 6 in., SAE 1035, heat	
treated	44
Set screws, oval points	67
Millard stude	
Milled studs	29
riat nead cap screws, listed sizes	16
Fillister head cap, listed sizes	37
Freight allowed up to 65¢ per 100	1h
based on Cleveland, Chicago or New Yo	ork

on lots of 200 lb or over.

FLUORSPAR

Me	tallurgical	grade,	f.o.b.	producing
Parametr 6	-		-	

Effec	tive	CaF	2	Cor	ite	n	t:			E	36	1.8	16			ort to
70%	or	more	3											0	0	\$35.00
65%	but	less	th	nan	70)9	6		0. 1		0	0				34.00
60%	but	less	t	han		35	%						0			33.00
Less	tha	n 60	%											۰		32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross 2	ron
Old range, bessemer	\$0	6.60
Old range, nonbessemer		8.45
Mesabi, bessemer Mesabi, nonbessemer	******	5.35 5.20
High phosphorus		5.20
Increases or decreases in	freight rai	tes,
dock handling charges and		
Apr. 1, 1948, are to be adprices.	ided to ab	ove

METAL POWDER

	for	Per pou	nd, 100	f.o.b.	shipping	point,	in	ton	lo
--	-----	---------	------------	--------	----------	--------	----	-----	----

Swedish sponge iron c.i.f. New York, ocean bags 7.9¢ to 9.0¢
Domestic sponge iron, 98+%
Fe 9.5¢ to 16 0¢
Eactrolytic iron, annealed,
99.5+% Fe19.5¢ to 39.5¢
Electrolytic iron, unannealed,
minus 325 mesh, 99+% Fe. 44.0¢
Hydrogen reduced iron, mi-
nus 300 mesh, 98+% Fe63.0¢ to 80.0¢
Carbonyl iron, minus 300
mesh, 98%, 99.8+% Fe90.0¢ to \$1.75 Aluminum
Brass
Copper, electrolytic
Cadmium
Chromium, electrolytic, 99%
min \$3.50
Lead 24.0¢
Manganese 50.0¢
Molybdenum, 99% \$2.65
Nickel, unannealed 51.5¢
Nickel, spherical, minus 30
mesh 53.0¢
Silicon 29.0¢
Solder powder8.5¢ plus metal cost
Stainless steel, 302 75.0¢
Tin \$1.01%
Tungsten, 98%, 99% \$2.90

COVE

Furnace, beehive (f.o.b. oven) Net To Connellsville, Pa\$12.00 to \$1 Foundry, beehive (f.o.b. oven)	n 3.00
Connellsville, Pa 13.50 to 1	4.50
Foundry, Byproduct Chicago, del'd\$18	.60
Chicago, f.o.b 17	.50
	N.S
Philadelphia, f.o.b.	0.50
	1.75
	0.45
Erie, del'd 19	96
	.90
St. Louis, del'd 18	.03
Birminham, del'd 10	5.71

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
No. 1 Ohio	\$67.00
First quality, Pa.,	Md., Ky., Mo.,
Ohio	73.00
First quality, New J	ersey 78.00
Sec. quality, Pa., Md	., Ky., Mo., Ohio 67.00
Sec. quality, New Jer	rsey 70.00
No. 2 Ohio	59.00
Ground fire clay, ne	t ton, bulk 10.50
Silica Brick	
Pennsylvania and B	irmingham\$73.00
Chicago District and	Alabama 82.00
Silica cement, net to	n (Eastern) 12.50
Fleet Chleege	

Exect Cureago	
Chrome Brick	Per Net Ton
Standard chemically Plymouth Meeting.	bonded, Balt., Chester\$64.00

THE OWNER OF THE OWNER O		200							
Standard,	Balt.	and	Chester						\$86.00
Chemically	bond	led,	Baltimore	0	0	ě.	0	0	75.00

Grain Magnesite

	std.	3/4 -In.	0	ra	İn	8						
Domestic,	f.o.b.	Balt.	8	nd	1	C	h	es	31	e	r	
in bulk,	fines	remove	be								. 1	51.80
Domestic,	f.o.b.	Chew	rel	ah	9	1	W	8	8	h		
in bulk	with fl	nes									0	27.0
in sacks	with	fines .			. 8				*	*	*	31.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢: Missouri Valley, add 20¢. \$11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

		SHEETS			STRIP		SHAPES	ВА	RS	ALLOY BARS				
CITIES	Hot- Rolled	Cold- Rolled (15 gage)	Galvanized (10 gage)	Hot- Rolled	Cold- Rolled		Standard Structural	Hot- Rolled	Cold- Finished	Hot- Rolled, A 4615 As-rr red	Hot- Rolled 1 4140-50 Ann.	Cold- Drawn, A 4615 As-rolled	Cold- Orawn A 4140-8 Ann	
Philadelphia. New York Boston Baltimore Norfolk Chicago	\$4.47 4.84 4.83 4.32 4.90 4.20	\$5.66 6.01 ¹ 5.69	\$5.92 6.16 6.23 ¹² 5.72 5.88	\$4.82 5.08 5.61 4.80 5.30 4.35	\$5.90 6.36 6.87 5.35-	\$4.82 5.11 5.18 4.77 5.15 4.55	\$4.54 4.80 4.91 4.71 5.15 4.35	\$86 5.06 5.04 4.65 5.20 4.35	\$5.73 5.78 5.88 5.71 3.00 5 0	fd.50 8.58 8.99	\$7.15 8.73 9.14	\$10.18 10.22 10.43	\$10.38 10.43 10.58	
Milwaukee	4.57 4.25 4.25 4.41	5.37 5.10 ¹ 5.10 5.26	5.95 5.82 6.06 6.07	4.72 5.05 5.26 4.77	6.65 5.83 5.95 5.97 5.67	4.92 4.60† 5.01 4.92†	4.72 4.70 4.40 4.82	4.72 4.40 4.40; 4.56-	5.48- 5.58 5.10 5.10 5.26	8.53 8.61 8.20 8.82	8.68 8.78 8.35 8.97	9.78 9.50 9.50 10.09	9.98 9.85 9.62 10.24	
Cincinnati St. Louis Pittsburgh St. Paul Omaha Indianapolis Birmingham Memphis	4.56 4.59 4.25 4.68 5.262 4.55 4.45 ¹¹ 4.88 ¹¹	5.22 5.39 5.10 5.53 5.38	5.57 6.17 5.65 6.08 6.712 5.93 5.80 5.08 ¹¹	4.77 4.69 4.35 4.78 5.362 4.65 4.4511	6.02 5.95 5.23 ¹¹	4.98 4.89 4.60 5.03 5.612 4.90 4.6511 5.0311	4.82 4.74 4.40 4.83 5.412 4.70 4.40 ¹¹ 5.03 ¹¹	4.82 4.78 4.76 4.40 4.83 5.412 4.70 4.4011 5.94	5.63 5.67 5.10 6.00 6.112 5.57 6.13	8.85 8.92 8.20	9,00 9.07 8.35	10.16 10.22 9.50	10.31 10.37 9.65	
New Orleans Houston Los Angeles San Francisco Seattle Portland Salt Lake City	*5.05 ¹¹ 5.55 5.78 5.35 ⁸ 5.45 ⁴ 5.70 6.40	7.26 ¹ 6.55 7.25 ² 7.25 ²	7.21 7.30 6.95 7.10 7.10 7.85	5.25 ¹¹ 5.65 6.00 5.70 ⁸ 6.15 ⁴ 5.85 ⁴ 6.70	8.60° 8.60°	5.40 ¹¹ 5.90 5.35 5.30 5.70 5.70 6.20	*5.10 ¹¹ 5.70 5.15 5.10 5.40 ⁴ 5.40 ⁴ 6.35	*5.2011 5.70 5.45 5.00 5.654 5.654 6.55	6.39° 7.00 7.35¹⁴ 7.40 7.45¹⁴ 7.45¹⁴ 7.55	9.40 9.55 ¹⁴ 9.55 ¹⁸	9.25 9.4010 9.4518 9.7015 8.9516	10.40 10.95 ¹³ 11.05 ¹⁵	10.55 11.25 11.20 11.30 11.30	

BASE QUANTITIES

Standard unless otherwise keyed on

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

nd bars, 400 to 1999 lb. COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over. ALLOY BARS: 1000 to 1999 lb. GALVANIZED SHEETS: 450 to 1499 lb. EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and

over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (li) 400 to 1999 lb; (14) 1800 lb and over; (li) 1000 to 4999 lb; (16) 4000 lb and over; (li) to 1999 lb.

*Add 46¢ for sizes not rolled in Birmingha † Up to % in. thick and 90 in. wide.

‡ Add 41¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do M include 3 pot tas on freight.

	BASING	POINT*	PRICES			DELIVERED PRICES† (BASE GRADES)									
Basing Point	Basic	No. 2 Foundry	Malle- able	Besse- mer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malie- able	Besse- mer	Low		
Bethiehem. Birmingham Buffalo. Chicago. Cieveland Duluth Erie. Everett. Granite City Neville Island Provo. Sharpsville. Steelton. Struthers, Ohio. Swedeland. Toledo. Troy, N. Y. Youngstown	40.00 38.88 40.00- 42.38° 38.50- 39.75° 39.00 45.25 39.00 45.25 39.00 40.00 39.50 45.25 39.00 39.00	40.50 39.38 40.00- 42.88° 39.00- 40.25° 39.50 39.50 39.50 39.50 39.50 39.50	41.00 40.50 43.38° 39.50 40.75° 40.00 39.50 46.25 39.50 39.50 46.25 39.50 39.50 39.50	40.00 40.50 40.00 40.00 40.00 46.50 40.00	46.00	Boston Brooklyn Cincinnati Jersey City Los Angeles Mansfield Philadelphia Philadelphia Philadelphia San Francisco Seattle St. Louis	Everett. Steelton Bethlehem Birmingham Bethlehem. Provo Cieveland-Toledo. Bethlehem Swedeland Steelton Provo Provo Granite City	\$0.50 Arb. 6.27 3.90 6.09 2.39 6.93 3.03 2.17 1.31 2.81 6.93 6.93 0.75 Arb.	46.27 43.90 44.97 42.39 45.93 41.53- 42.78 42.17 46.31 45.93 45.93 46.00	45.50 45.47 42.89 44.43 42.03 43.28* 42.67 46.61 46.43 46.43 46.43 46.50	48.00 43.39 42.53 43.78* 43.17 47.00	43.89 43.67 47.61	52.2.4		

* Republic Steel Corp. price. Basis: pig iron at Cleveland and Buffalo set by average price of No. 1 hvy. mlt. steel screp is Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 88¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 8.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pet nickel.

Silvery iron (blast furnace) silicon 6.00 te 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio-\$49.50; f.o.b. Buffalo-\$50.75. Add \$1.25 per ton for each additional 0.50 pct 81, up to 12 pet. Add 50¢ per ton for each 0.50 pet

Min over 1.00 pct. Add \$1.00 per ton for 15 pct or more P. Bessemer ferrosilion prise are \$1.00 per ton above silvery iron prices i comparable analysis.

Charcoal pig iron base price for low plan phorus \$58,00 per gross ton, f.o.b. Lin Tenn. Delivered Chicago, \$65.55. Exphosphorus charcoal pig iron is not best produced.



Cold-Drawn A 4140-80 Ann.

\$10.38 10.43 10.58

9.50

10.31 10.37 9.65

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Low Phos.

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Better Power Transmission Through Better Bears

THOMAS flexible couplings

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-- NEWS OF INDUSTRY

Additional Warehouse Chapter Officers Are Announced by Doxsey

Cleveland

• • • Thirteen chapters of American Steel Warehouse Association, Inc., have elected officers for the coming year, according to an announcement by Walter S. Doxsey, association president.

Baltimore Chapter

President—Henry A. Lowry, Seaboard Steel & Iron Corp., Baltimore; vice president—Harold K. Dell, John J. Greer & Co., Inc., Baltimore; secy.-treasurer—J. B. Boan, United States Steel Supply Co., Baltimore; nat'l director—George J. Parke, Eagleston-Parke, Inc., Norfolk, Va.

Buffalo Chapter

President — Joseph T. Durham. Drennan Steel Products Corp., Syracuse; vice president—D. P. McCaln. Erie Concrete & Steel Supply Co., Erie; secy.-treasurer—D. Enos, Enos & Sanderson Co., Inc., Buffalo; nat'l director—J. Frederick Rogers, Beals, McCarthy & Rogers, Inc., Buffalo.

Central States

President—T. Z. Hayward, Joseph T. Ryerson & Son, Inc., Chicago; vice president—M. O. Hjortland, The Steel Supply Co., Chicago; vice president—J. H. Flora, Hagerty Brothers Co., Peoria, Ill.; secretary—T. B. Daniels, Jones & Laughlin Steel Corp., Chicago; treasurer—C. O. Bucksot, W. J. Holliday & Co., Indianapolis; nat'l director—H. V. Douglas, Central Steel & Wire Co., Chicago.

Connecticut Chapter

President—G. S. Brousso, The C. S. Mersick & Co., New Haven, Conn., vice president—W. V. Starkie, L. L. Ensworth & Son, Inc., Hartford; secy.-treasurer—J. H. Walters, Chapin & Bangs Co., Bridgeport, Conn.; nat'l director—R. B. Shearer, The C. S. Mersick & Co., New Haven, Conn.

Cincinnati Chapter

President—Edwin Morris, E. K. Morris & Co., Inc., Cincinnati; vice president—R. E. Wente, S. A. E. Steels, Cincinnati; vice president—Louis K. Wirth, Todd Donigan Iron Co., Louisville; secretary—E. W. Patton, Brown Steel Co., Columbus; treasurer—Earl R. Nelson, Joseph



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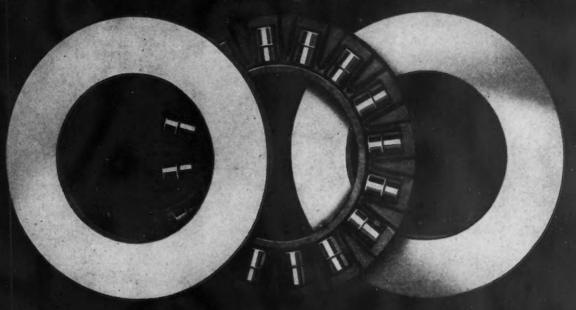
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SIZES AS LISTED CARRIED IN STOCK

Bearing No.	В1	Sizes and	Dimensions C	• See Draw	ing Above	Н	Roller Diam.	R 45° Chamfer	Lbs. †Capacity at 100 R.P.M.
RT-26	2.002"	2.015"	2.010"	5.968*	6.000"	1.375"	1/2" 1/2 1/2 1/2 1/2 1/2	.062"	36,000
RT-27	2.002	2.015	2.010	6.968	7.000	1.375		.062	48,300
RT-28	2.002	2.015	2.010	7.968	8.000	1.375		.062	65,400
RT-36	3.002	3.015	3.010	5.968	6.000	1.375		.062	29,800
RT-37	3.002	3.015	3.010	6.968	7.000	1.375		.062	43,600
RT-38	3.002	3.015	3.010	7.968	8.000	1.375	1/2	.062	55,600
RT-39	3.002	3.015	3.010	8.968	9.000	1.375	1/2	.062	67,500
RT-47	4.002	4.015	4.010	6.968	7.000	1.750	5/8	.062	34,700
RT-48	4.002	4.015	4.010	7.968	8.000	1.750	5/8	.062	54,600
RT-49	4.002	4.015	4.010	8.968	9.000	1.750	5/8	.062	69,400
RT-410	4.002	4.015	4.010	9.968	10.000	1.750	5/8	.062	89,300
RT-58	5.002	5.015	5.010	7.968	8.000	1.750	5/8	.062	40,300
RT-59	5.002	5.015	5.010	8.968	9.000	1.750	5/8	.062	63,300
RT-510	5.002	5.015	5.010	9.968	10.000	2.000	3/4	.125	83,300
RT-511	5.002	5.015	5.010	10.968	11.000	2.000	3/4	.125	111,600
RT-512	5.002	5.015	5.010	11.968	12.000	2.000	3/4	.125	136,300
RT-69	6.002	6.015	6.010	8.968	9.000	2.000	3/4	.125	48,300
RT-610	6.002	6.015	6.010	9.968	10.000	2.000	3/4	.125	76,000
RT-611	6.002	6.015	6.010	10.968	11.000	2.000	3/4	.125	100,100
RT-612	6.002	6.015	6.010	11.968	12.000	2.000	3/4	.125	124,300
RT-710	7.002	7.015	7.010	9.968	10.000	2.000	3/4	.125	62,400
RT-711	7.002	7.015	7.010	10.968	11.000	2.000	3/4	.125	85,800
RT-712	7.002	7.015	7.010	11.968	12.000	2.000	3/4	.125	109,200

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Munitions Board Calls 114 More War Facilities Essential to Security

Washington

• • An additional 114 surplus war-built industrial plants, including nearly two score steel and aluminum plants, foundries and other metalworking plants, have been classified by the Munitions Board as essential to national security. Any disposal arrangements by War Assets Administration will include a governmental recapture clause.

This brings to 423 the number of war-built facilities which will be retained as production potential as a result of various governmental actions. Also, about half the original \$12 billion in construction cost is involved.

Of this total, 151 complete plants have been retained by the military services under Public Law 364. These are comprised largely of specialized iron and steel products plants, aircraft factories, shipyards ordnance and ammunition plants arsenals and combat vehicle plants.

Another 158 plants were on the original list for disposal subject to the Security Clause. Of these, 31 have been sold by WAA, another 30 have been leased to private industry, and 23 are continuing operations for both civilian and military purposes. Nearly half the remaining 62 are of such nature that their disposal to private industry is unlikely.

Included in the new list of 114 plants the the following (numerals are Plancor designation):

Consolidated Steel Corp. plants at Wilmington, Calif., and San

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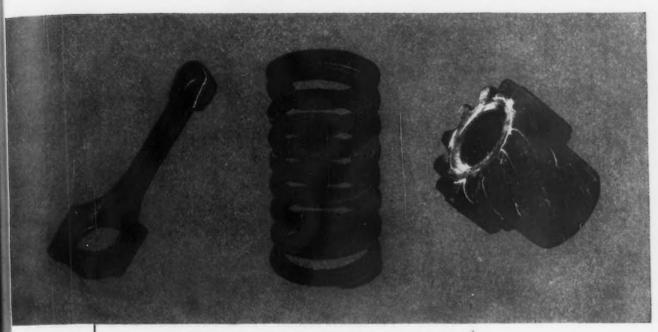
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- 1. TROUBLE due to excessive scrap in production.
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With proper inspection by Magnaflux at early steps in production you can cut manufacturing costs as well as eliminate these five kinds of trouble.

When you inspect at various stages of your operations, you keep your finger on the pulse of production. You catch defective parts before additional money is wasted in machining and finishing time. You can single out a process causing defects, and correct it.

Automatic machines for volume production lines enable you to inspect by Magnaflux at low cost. Magnaflux, and other Magnaflux Corporation non-destructive testing means, make fine cracks and other discontinuities readily visible. The non-visible defects such as cracks in castings, seams in bar stock, or laps in forgings are marked by easily seen indications of bright color, or can be made fluorescent under black light. Every part can be economically inspected, or sampling inspection used when desired.

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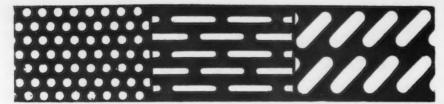
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NEWS OF INDUSTRY

Francisco; four Copperweld Steel Co. plants at Warren, Ohio (333, 334, 383, and 1130); and three Willamette Iron & Steel Co. facilities at Portland (50, 772, 1956).

Alcoa plants at Riverbank, Calif., Newark, Ohio, Maspeth, N. Y. (226-A-1), Trentwood, Wash. (524 & 1061), McCook, Ill. (652), New Castle, Pa., and Kansas City, Mo.

Scullin Steel Co. (1672 & 299), St. Louis, Mo.; Atlantic Steel Casting Co., Crum Lynn, Pa.; Barium Stainless Steel Co., (709), Lorain, Ohio; Commercial Iron Works, Portland, Ore.

Crucible Steel Co., (466), Midland, Pa.; Republic Steel Corp., (1514), Warren, Ohio; and Youngstown Sheet & Tube Co., (328), Indiana Harbor.

Continental Foundry & Machine Co., (294), Coraopolis, Pa.; Howard Foundry Co., Chicago; Pittsburgh Steel Foundry Co., (659), Glassport, Pa.; Ohio Steel Foundry Co., (875), Lima, Ohio; and Hughes Tool Co., (143), Houston.

Revere Copper & Brass Co., (91), Chicago; National Smelting Co., Cleveland; Eagle Picher Mining & Smelting Co., (1023), Henryetta, Okla.; Domestic Manganese & Development Co., (1084), Butte, Mont.; and Hegeler Zinc Co., (971), Hegeler,

Tunnel Kilns Used To Make Sponge Iron

Washington

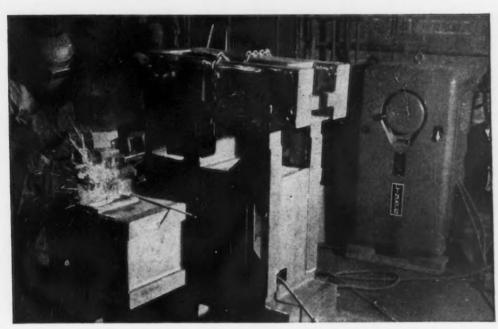
• • • High-grade sponge iron can be produced in large tunnel kilns similar to those used in modern ceramic plants for making refractory ware, according to a Bureau of Mines report.

On the basis of results of experiments at a commercial plant in Salisbury, N. C., the highest-grade sponge iron ever made by the Bureau was produced in a tunnel kiln and the product compared favorably with the long-established premium quality made in ceramic kilns in Hoeganease, Sweden. It is believed that production costs could be cut materially with better mechanization, such as multiple charging, and other developments in operational technique, the Bureau report states.

A free copy of the publication, Report of Investigations 4271. "Manufacture of Sponge Iron in Ceramic Tunnel Kilns," may be obtained by writing to the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

Arc Booster Makes AC Welding Easier

BY GEORGE G. LANDIS, ENGINEERING VICE PRESIDENT THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO



Fabricating all-welded machine frame with 500 ampere "Fleetwelder."

ARC WELDING with AC welders has been greatly simplified by the Lincoln "Arc Booster." With this exclusive feature, arc striking becomes as simple as lighting a match.

Eliminates Electrode Sticking

The "Arc Booster" control is a simple device which gives the arc a momentary burst of welding current the instant the electrode touches the work, starting the arc automatically. In a fraction of a second after the arc is struck, the welding current returns to the amperage selected for the job.

Increases Safety

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The "Fleetwelder" is safe to operate under all conditions. By making possible easy welding with open circuit voltages not exceeding 63 to 70 volts (depending upon the capacity of the welder), the "Arc Booster" eliminates the hazards of high open-circuit voltage or high frequency used in conventional welders to improve arc striking.

Improves Penetration

The instantaneous burst of welding current as the electrode touches the work causes the arc to "dig-into" the

parent metal. This improves weld penetration at the start of the bead, particularly important for tack welding or for short beads.

"Arc Booster" Has Job Selector

Any one of six stages of booster current intensity is instantly available with a Job Selector switch, providing accurate control of booster current to suit each welding job. This Job Selector is of special value when changing from thin sheets to heavy plate.

Improves Arc Characteristics

The welder has a reactor type of control which is a free circuit, especially designed for high responsiveness to changing arc conditions. It is separate from the main transformer which is designed for high efficiency. This design gives high arc sensitivity and an exceptionally wide range of output for maximum ease and speed of welding under all conditions.

Reduces Idle Current Consumption

The independent control circuit eliminates the need for high open circuit voltage, contributes to higher power factor. By reducing amount of condensers needed as much as 66%, this new welder minimizes idle current input.

The above is published by LINCOLN ELECTRIC in the interests of progress. Write for free copy of Bulletin 366.

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Advertisement

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The Standards Department (Concluded from Page 83)

we have actually cut the variety in half on some large jobs. In terms of the assembly line, effort is exerted to keep the number of pans of nuts and screws to a minimum.

Reference is made to the similarity file to see whether any part already in production has been duplicated, or whether the design could be varied to accept a production part which is very similar although not an exact duplicate of the experimental part. The process specifications, of course, are examined in the same manner as the other details. This opportunity to see the whole picture cannot be had unless the standards department is geared right into the development process.

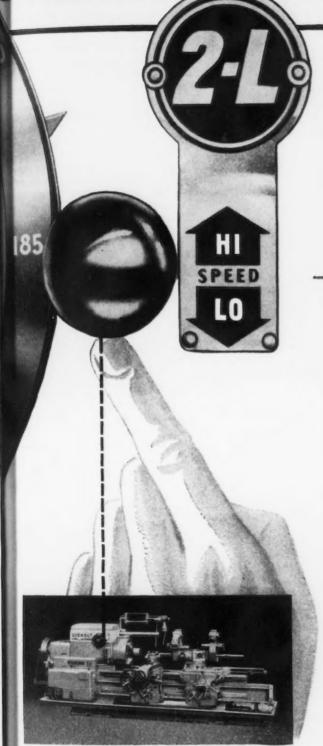
When all the recommendations are gathered, the engineer, the standards department and designer thrash out the whole project until agreement is reached, then the drawings and bill of material are changed accordingly. This is all done before an experimental model is made. Before standardization was coordinated with engineering and design that was not done. Models with unnecessary special items were made and tested, the design became frozen and it was too late to do much about it without incurring considerable expense.

In addition to being an integral part of the engineering operation. the standards department must be acquainted with the problems of production procurement, tooling. material control, cost estimating and inspection in order that the introduction of new standards or changes in old parts to conform to standard will not disrupt production too seriously. Close coordination with these non-engineering groups will act as a brake on possible over-enthusiastic introduction of changes which might create so much confusion that a great deal of their value will be lost and many people antagonized.

Can Reproduce German Nickel and Iron Alloy

Washington

• • • Scientists at the Naval Ordnance Laboratory, White Oak, Md., have reproduced for the first time in the United States a magnetic alloy (Permenorm 5000-Z) which will make possible important changes in the rectification of electric power, the Navy Dept. has announced. GISHOLT TURRET LATHES



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Speed changes (6-1 ratio) are made by hydraulically operated clutches. This standard feature on all Gisholt Turret Lathes is a big advantage in drilling-tapping, boring-reaming, and turning-threading operations.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

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No manual gear shifting.

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represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



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A precision gauge can be only as accurate as the grinding machine used to finish-grind it. The sub-assemblies of a giant crane present an entirely different grinding problem. Whether in removing a few ten thousandths of metal in a high-accuracy operation, or in removing a lot of metal with greater allowable tolerances, freedom from spindle play is extremely important. That's just one of the reasons why you find Grand Rapids Grinders in so many leading plants of all types—from manufacturers of precision gauges to makers of huge cranes.

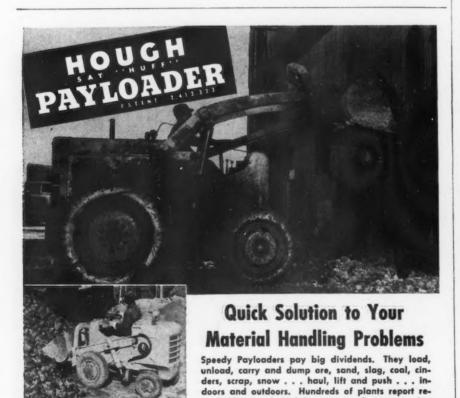
Other assurances of long-life accuracy and speed are: the fastest longitudinal table speed (125 f.p.m.) available in any grinder; vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; Bijur one-shot lubricating system.

*Accuracy within 0.00025 limits.

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NEWS OF INDUSTRY

Pressed Metal Men Of Toledo District Elect New Officers

Toledo, Ohio

• • • At a recent meeting of the Toledo district of the Pressed Metal Institute, Wilfred Williams, sales manager of the Acklin Stamping Co., was elected chairman of the Toledo district, replacing William H. Schomburg, president of the Superior Spinning and Stamping Co.

Other officers for the coming year, are as follows: Trustee-at-Large, William P. VonBehren, vice-president of Swartzbaugh Mfg. Co., Toledo; First Vice-President, L. H. Schneider, president Toledo Stamping and Mfg. Co.; Treasurer, Louis J. Schindler, vice-president Schindler Stamping and Toy Co., Toledo; Secretary, Clyde Morrison, president Metal Electric Processing Co., Toledo.

A resolution was passed by those in attendance, instructing the Toledo representatives to re-elect Tom J. Smith, Jr., of Cleveland national president of the institute at the National Trustees Meeting, which is scheduled to be held Apr. 21. at the Cleveland Hotel.

Trustees who will attend the Cleveland meeting are F. Cyril Greenhill, member of the National Executive Committee; William P. VonBehren, and Wilfred Williams.

Minor Changes On Tin And Can Orders Are Out

Washington

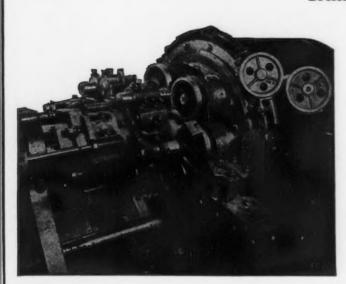
• • • Minor changes in Conservation Orders M-43 (tin) and M-81 (cans) have been announced by the Office of Domestic Commerce, Dept. of Commerce.

Principal changes in M-43 include (1) tightening of the delivery. use and small order provisions; (2) introduction of a simplified standard customer's certificate; (3) inclusion of specifications to guide tinplate manufacturers in checking tin coatings to determine conformity with restrictions; (4) revision of import-export provisions to cover all forms of tin: (5) establishment of tin-coating specifications for general-purpose export crowns which correspond with those for domestic-use crowns. Both types now are restricted to .25-lb tin coating.

The amendment of M-81 incorporates measures to conserve tin in the manufacture of cans.

FOR HIGH PRODUCTION OF WORK REQUIRING FINE FINISHED SURFACES AND TO CLOSE LIMITS.

BAIRD No. 76H CHUCKER



Here is shown a "Baird" #76H Chucking Machine, set up for turning, facing and boring gear Blanks made of a Special Cast Iron having a Rockwell hardness—85-90 B Scale.

The O.D. is finished turned to 6.800 plus or minus .001 and both faces are finished to 1.000 width, plus or minus .001.

The Hole is finished bored and reamed .750 diameter to plug gage and is concentric with the O.D. turning within .001 total indicator reading.

The work is held in Standard "Baird" Three Jaw Contracting Chucks, using stud type jaws for gripping. (The Spindle Turret is shown partially indexed to better illustrate the method of chucking.)

This gear is completely turned as shown to the required accuracy at the rate of 55 pieces per hour.

Some of the exclusive features which have made this "Baird" 7" six spindle horizontal indexing lathe outstanding are:

INDEPENDENT TOOL SLIDES. The longitudinal tool slides may have different strokes and the cross slides are independent and have their strokes, all as best suits the job. All tool slides have micrometer adjustment.

DIFFERENT SPEEDS AT SPINDLES. Ability to choose a speed for the spindle at each work station to suit the operation to be performed at that station permits of best product in least time.

AUTOMATIC CHUCKING. Operator has both hands free to handle the work. No levers or handles to require his attention or take his time.

ATTACHMENTS. Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

AUTOMATIC MECHANICAL STOP. This stops the machine at the end of each cycle if operator has not unloaded and reloaded in the proper operation of machine. This and other safety features make for least loss due to damage and for greatest safety.

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Peacetime Military Service Policies Are Surveyed In Industry

New York

• • • Definite military leave policies have been adopted in more than 85 pct of nearly a thousand companies surveyed by the National Industrial Conference Board. No policy has been determined in many of the remaining companies because "none" or only a "few" of their employees are members of the National Guard or a Reserve unit of the Army, Navy, Marines, or Air Forces.

The Board surveyed the military leave policies for salaried employees in 466 companies, and for hourly workers in 455 other companies.

Military Leave for Salaried Em-

ployees

Of the 380 companies that have formulated definite military leave policies for salaried employees, about half permit time off for military training in addition to regular scheduled vacations.

Military Leave for Wage-Earners

In the 407 companies where military leave policies exist for hourly workers, the great majority do not grant leaves of absence in addition to the vacation allowance.

Size of Company as a Factor

Most of the cooperators that do not grant extra time off for military training are small companies. For example, among the 106 companies with fewer than 250 employees, only nine grant time off to hourly workers. But twenty-six of the thirty-two companies with more than 5,000 employees grant additional time off to hourly workers for military training.

Length of Leave Granted

This survey reveals that the length of military leaves varies from one week to one month. Among the cooperating companies, the two most prevalent leaves of absence periods are two weeks and fifteen days. Some companies have set no maximum leave time and indicate that leave is granted for "the time required."

Compensation Practices—Salaried Employees

Of the companies having a pay policy for salaried employees in the National Guard, about a third make up the difference between the governmental compensation (if less) and the employee's regular salary. Compensation Practices — Hourly

Workers

In the cooperating companies having a pay policy for hourly

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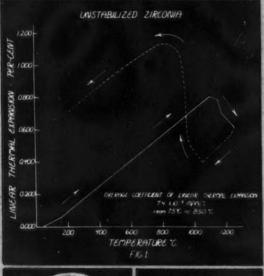


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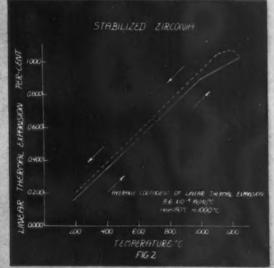
precious metals such as platinum and high melting point super-alloys. They offer excellent possibilities in other applications. More detailed information may be secured from TAM research and engineering staffs or by writing direct.

COMPARATIVE CHARTS POINT UP ADVANTAGES





Unstabilized crucible cracked badly after one cycle of air quenching from 15 minutes at 2800° F.







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NEWS OF INDUSTRY

workers in the National Guard, about 40% make up the difference between the workers' active duty training pay and his normal company earnings. Over half grant time off for training but give no company pay to the worker while he is training. A few companies grant full company earnings while the worker is on leave or else report special compensation plans for hourly workers in the National Guard.

Supply of Top-Grade Steel Is Threatened Chemists Are Told

Moraine City, Ohio

• • • A continuing flow of high quality steel products made from sheet metal can be assured only by intensive research, Harold P. Gaw of Armco Steel Corp., Middletown. Ohio, declared at a meeting of the Dayton section of the American Chemical Society.

Steel producers employing the widely used openhearth refining process must contend with increasing amounts of sulfur in their raw materials, according to Mr. Gaw, who explained that a sulfur content of more than about one-fortieth of 1 pct makes steel too hard and brittle to be easily drawn.

"Despite the fact that the openhearth process has been in use since 1860, chemists and metallurgists still do not fully understand how sulfur is removed from the molten metal, Mr. Gaw stated. The high temperature of 3,000° is in itself a barrier to detailed chemical studies, he noted, and this accounts for the "rather meager information available on the sulfur reactions."

Chemical and metallurgical research and the experience of operators have shown that a number of factors stimulant efficient removal of sulfur from the metal, Mr. Gaw said, citing high alkalinity of the slag, low iron oxide and high manganese oxide content, fluidity of the slag, quantity of slag, fast melting, and a low total input of sulfur.

"The problem of sulfur removal is likely to become greater because of a trend toward increasing sulfur input from raw materials, as well as fuels," he asserted. "Further intensive study of the fundamentals of sulfur removal are necessary in order to obtain still further knowledge, and to be able to do the job confronting openhearth operators."